The practical fisherman

John Harrington Keene

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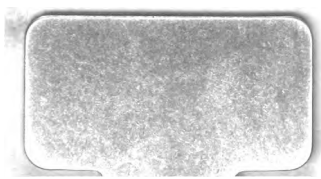

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The Practical Fisherman:

DEALING WITH

THE NATURAL HISTORY, THE LEGENDARY LORE,

THE CAPTURE OF

BRITISH FRESHWATER FISH,

AND

TACKLE AND TACKLE MAKING.

ILLUSTRATED.

By J. H. KEENE.

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PREFACE.

I AM persuaded that the amateur, and, in some cases, the experienced, angler, has hitherto suffered from the want of a work which, while setting forth the *modus operandi* of fishing, should, at the same time, supply items of the natural as well as of the traditional history of the quarry in which he is interested. So far as I know, except the present work, there is none other fulfilling the requirements indicated. With all humility I offer this volume as an earnest, but perchance, a crude attempt to supply the deficiency.

In compiling such portions of the book as were unavoidably derived from sources other than my own experience, two courses—judging from early and recent fishing writers—seemed open to me, one, the paraphrasing of others' research without direct acknowledgment, and the other course a complete quotation with full indication from whence derived. I have invariably chosen the latter method, and hence my work may seem here and there to lack originality.

To the tyro this will matter little; and the experienced angler will be able to verify whatever I state to be the result of my personal observation, because if he be an able fisherman it will coincide with his own.

J. H. K.

LONDON,

February 1st, 1881.

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The Practical Fisherman.

CHAPTER I.

INTRODUCTORY.

THE angler who may, perchance, be also a bit of a bibliographer, will probably exclaim at the appearance of another treatise on the gentle craft. So many works on this charming subject have been written and published, from Oppian to the present time, that another would seem superfluous, and only capable of vain repetitions. This need not be so, however, and in the following chapters I shall take care that it is not so. A severely practical, careful *résumé* of what is known and proved, and a concise account of what the writer has himself experienced, need not come under the category of vain repetition, and may be useful to many learners seeking those almost Parnassian heights, whence the fully initiated smile at the scoffers and mockers of the art which Byron so ill-naturedly termed "that solitary vice." And, indeed, there are several other reasons why a dissertation on practical angling may not be unwelcome. The price of every really capable work on the subject is generally prohibitory to that class of persons who make the art their chief recreation during the intervals of work at the mill or factory, counter or desk. To such what I have to say will I hope at least be interesting, and it is to such chiefly that I shall address myself. It would probably be presumption on my part to suppose I could say anything on so trite a subject which would enlighten those who have the power of consulting a whole library of fishing authors, whose chief merit, however, seems to be prolixity. The importance,

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also, of the pursuit may be another reason why additional consideration of angling could advantageously be given. The number of anglers is so vast and so continually increasing that it very appropriately now bears the title of a "national sport." With increasing numbers of anglers the scarcity of fish, although not appreciably becoming greater, undoubtedly does increase, and the education of the fish, combined with this scarcity, require greater finesse and more subtle means for their capture. Observations on these refinements are, therefore, not out of place. I shall endeavour in the course of the following pages to give notices of the latest of these, and the most effective, with various little inventions of my own, which have been put in practice in view of the increased skill required in the capture of our quarry.

It is customary at all entertainments to issue a programme of what is intended to be performed, and I will therefore follow so good an example. Briefly, I may say that, under the title I have chosen, separate consideration is given to the following cognate subjects: The general history of angling, tackle and baits; ichthyology, or the science of fishes; nearly every fish inhabiting the fresh water, or migratory, in Great Britain, described in turn according to classification; and last, but not least, the art of tackle making is considered. Sea fishing may form the subject of another treatise at some future time. It will be observed that special attention is paid to the subject of ordinary tackle making, for, to my mind, one of the chief charms of successful angling is the reflection and knowledge that the fish captured are really and truly, solely and wholly so, by one's own appliances and skill, and thus the sense of possession is rendered doubly sweet. In treating also of each fish for the convenience of reference, the following divisions and subdivisions are observed: Natural history—including habitat, food, season, diseases, &c.—piscine folk lore, tackle, baits, and gastronomical, &c. Of course, notwithstanding the comprehensiveness of this syllabus, I am well aware that no book or treatise can alone make an angler. Hear what Saint Izaak Walton says on this point: "Now for the art of catching fish, that is to say, how to make a man that was none to be an angler by a book; he that undertakes it shall undertake a harder task than Mr. Hales, that in a printed book called 'The Private School of Defence' undertook to teach the art of fencing, and was laughed at for his labour. Not but that many useful things might be observed out of that book, but that the art was not to be taught by words; nor is the art of angling." Indeed, some have gone to the length of applying the old maxim, *Poeta nascitur, non fit*, to the angler—an angler is born, not made, say they. I do not go quite so far as that, however, but fully believe that one ounce of practice is worth a bushel of theory.

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Both are, nevertheless, good in their places. I ask the angler in all cases to prove by experiment, if possible, all that I try to teach by words.

After all this explanatory matter, which, albeit necessary, is eminently dry to the reader as it is to the writer, I come to touch upon a much more agreeable topic, viz., the position angling holds as a sport, and the reason why it exerts such a fascination over its votaries, for this comes properly under the heading "Introductory." To the initiated I am fully aware that a disquisition on this is unnecessary; but to the *un*initiated, who have probably read or heard quoted Johnson's snarl about "a worm at one end and a fool at the other," it is desirable to show succinctly why presumably sane men follow such an apparently inane, senseless occupation. Even Plutarch has spoken against it as a "filthy, base, illiberal employment, having neither wit nor perspicacity in it, nor worth the labour." Think of that, brother anglers! Let this man be *anathema maranatha*, likewise all others who rail against the most gentle of crafts!

Man, and indeed all animals, seem to have an innate desire to hunt, *i.e.*, to acquire by personal exertion. In the lower animals this desire is put in action primarily for the sake of the food it brings; in man, the hunting, whether of fish, flesh, or fowl, or good red herring, may exist, as in angling, without the desire for the food acquired. The exercise of all or any of man's powers or desires gives pleasure, and the fact that the desire to hunt in angling is accompanied in its exercise by the employment of more skilled and varied accomplishments and subtleties of manipulation than any other sport is the chief reason why so many practise it. That the influence of the spell is lasting is also demonstrated in the truth that few (none, I might say) give it up until the latest possible minute. The angler has the same undying steady affection as the *litterateur* is said to have for his profession. A hundred chances may deprive a man of his cricket, shooting, or hunting, but angling may be and is often pursued till the veteran "goes over to the many." Indeed, instances of the ruling passion strong in death in connection with the gentle art are not wanting. Jesse, in his delightful "Angler's Rambles," says that the answer to the captor of a beautiful Thames trout, who had sent over to his friend to come and see it, was, that the friend was dying, but "that it would be a vast satisfaction to him if he could *see* the fish, provided it would not be injured by being conveyed to his house for that purpose." This wish was gratified, and Jesse remarks, "Mr. T. feasted his eyes upon it, and soon afterwards closed them for ever." This "ruling passion" has been very beautifully expressed by Mr. Westwood, in the "Newcastle Fishers' Garland" for 1863. He represents an old angler dying,

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and desiring his son and daughter to place him in full view of the delightful river Coquet. This they do, and he says:

Now place my rod beside my hand—
I live in days gone by:
I climb the steep, I move the deeps,
I throw the cunning fly.
Wild whirls my reel, full grows my creel,
Oh, son! oh, loving daughter!
In maddest dream was ever stream
Could match with Coquet's water?

And so on. I know myself of an angler who still wears beneath the weight of eighty-five years a young man's heart and spirits, which he says is due to seventy years of angling. I assure my readers I have drawn from his valuable experience in the succeeding chapters. Will these facts recommend the uninitiated to angling? for, like all true believers, I seek ever to proselytise.

The charm this species of amusement exerts over the angler must be powerful to afford such examples as those I have just quoted, and besides the general reason already given for this, there exists another hardly less considerable, and this may be sought for in a quality which most men possess, namely, a love of nature. This is splendidly explained in the oft-quoted passage from the Prioress of St. Albans, which I have rendered into modern English that the reader may the more readily read it, and which I beg leave to reproduce, it being, apart from its special reference to angling, a sweet pastoral prose poem. She says: "And yet at the least he hath his wholesome walk, and merry at his ease a sweet air of the sweet savour of the mead flowers, that maketh him hungry. He heareth the melodious harmony of fowls. He seeth the young swans, herons, ducks, coots, and many other fowls, with their broods, which to me seemeth better than all the noise of hounds, the blast of horns, and the cry of fowls, that hunters, falconers, and fowlers can make. And if the angler take fish surely there is no man merrier than he is in his spirit." Old Walton also teems with this love of natural music which so eloquently appeals to the angler's better nature, and which in the end becomes as familiar voices from whose soft fascination he cannot nor does he wish to break. Let my readers listen to a few words from him—Byron terms him a "quaint old cruel coxcomb," with his accustomed sneer—and, after thinking over what they mean, and what I have above said, say whether there is any method or not in the angler's madness. Thus: "Look! under that broad beech tree I sat down when I was last this way a fishing. And the birds in the adjoining grove seemed to me to have a friendly contention with an echo whose dead voice seemed to live in a hollow tree near the brow of that primrose hill. There I sat, viewing the silver streams glide silently

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towards their centre, the tempestuous sea, yet sometimes opposed by rugged rocks and pebble stones which broke their waves and turned them into foam. And sometimes I beguiled time by viewing the harmless lambs, some leaping securely in the green shade, whilst others sported themselves in the cheerful sun. . . . As I sat thus these and other sights had so fully possessed my soul with content that I thought, as the poet had happily expressed it:

> I was for that time lifted above earth,
> And possessed joys not promised in my birth."

Was ever such a charming scene presented by poet or painter before or since? and to the sympathetic reader this quotation, of many others, unfolds the secret of the formation of the pleasant thraldom with which angling—not "pot hunting"—environs its disciples.

For, indeed, what can be more soothing to man's nature than the soft murmur of the breeze as it caresses the slender reeds or soughs gently through the rushes, kissing the slowly flowing stream and raising a smiling dimple of pleasure in the otherwise inanimate water? The artisan from the mill, though his hands be hard and horny, has a man's love of Nature; the tired business man, with his head hitherto full of shares, bonds, coupons, debentures, and what not; even the statesman, like Lucretius, "his mind half buried neath some weightier argument"—all are subdued by the tender force of unsophisticated Nature. But they must have had the angler's training to enjoy it. Who but an angler, having learned patience and accepted the gifts of contemplation—it is "the contemplative man's pastime"—could have written this passage anent the nightingale: "He that at midnight, when the very labourer sleeps securely, should hear, as I have very often, the clear airs, the sweet descents, the natural rising and falling, the doubling and redoubling of her voice, might well be lifted above earth and say, 'Lord, what music hast Thou provided for the souls in Heaven, when Thou affordest bad men such music on earth?'" Magnificent as is that ode on this bird—of one "whose name is writ in water," John Keats—no passage in it can compare to this simple piece of heart poesy. The charm of angling is not broken since this was written.

Now, it may be asked, what special qualifications ought a would-be angler to possess in order to enjoy the pleasures so enthusiastically enumerated? I answer that, inasmuch as that all men cannot be appreciative of Nature and her works, in the same way that all men cannot be poets, painters, or writers, so is it that *all* men who handle a rod cannot be recipients of the superlative pleasures derivable from

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the gentle craft. To be able to accept, and by an inward process to turn all natural examples of beneficence as furnished by our lakes and rivers and general natural scenery to the delectation of the intellectual and moral nature, in every case implies the true poetic faculty in its fullest fruition. Many are able to use it in its entirety. The best anglers I have ever met have been keen, intelligent men, of strong, sanguine, sensitive and eloquent natures, and possessed of that rare power of making the hand answer to the eye—intuitive judgment, and, chiefly, strong athletic bodies. This is my experience, and, as such, I think it will bear scrutiny. The gross picture of "Patience in a Punt," either under the broiling sun or bursting heavens, *sans* sport, *sans* cheerfulness, *sans* everything that makes life endurable, is the absolute opposite to the general truth. Under all circumstances the true angler is infinite in schemes and stratagems—"dodges" is the better term—is ever hopeful and watchful, spares no pains, and absorbs as a sponge does water the pleasaunce around him, his quick well balanced wrist and his clear eyesight can hook and play the fish and on the finest tackle land him. It is a miracle of fishing—to land a large fish on such a fragile thread that a half pound dead weight would break it. The *Field* reported the capture of a pike in its 'teens, brought to bank by an angler roach fishing with fine hair—this captor was an angler-hero.

To show, in conclusion of a somewhat longer "introduction" than I at first intended, that there are large numbers of anglers who, in effect, feel and think as I have written, an interesting calculation has been made by Mr. Manley, in his book on "Fish and Fishing," on London angling, which I am sure he will allow me to reproduce. He says: "I gather that there are at the present time about eighty angling clubs or societies in the metropolitan districts, fifty-three of which are associated together under the name of the United London Anglers, and pay social visits in relation to the head centre. The fifty-three clubs have, in round numbers, 1700 members, and the other clubs 500, the very great majority of whom are small shopkeepers, mechanics, and working men. Of the same class there are at least 1000 regular anglers in the London districts who belong to no club. Further, it may be calculated that there are 500 more regular anglers who reside in the vicinity of the Thames and Lea. To these may be added 1000 at least of regular anglers of the upper classes, gentlemen, merchants, and large shopkeepers. These, added together, will give a grand total of 5000 persons who make angling their chief recreation in a moderately circumscribed area of which London is the centre." Now, these figures are certainly within the mark, and the estimate recently made in "The Country" journal that there are 50,000 anglers properly so called in England and

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Wales cannot, I think, be considered too high. The art is spreading more and more every day. The necessity for general legislation in its favour has at last made itself apparent. The humanising and peaceful recreation is esteemed by those who do not practise it, and everyone of thought or appreciation would acknowledge it as an "art," a category to which it was assigned by Walton 200 years ago.

The space, however, allotted to this most extravagant of "introductions" fails. I have endeavoured to impress upon readers the real significance of the art. Perhaps, as a sort of postscript to all I have said, the angler's song, entitled "Invitation," the author however of which I do not know, will add a seal to my enthusiasm :

Oh, while fishing lasts enjoy it!
Let us to the streams repair;
Snatch some hours from toil and study,
Nature's blessed gifts to share.
Ye who stand behind the counter,
Or grow pallid at the loom,
Leave the measure and the shuttle,
To the rippling stream come, come!
He that clothed these banks with verdure,
Dotted them with various flowers,
Meant that ye, though doomed to labour,
Should enjoy some cheering hours;
Wipe your reeking brows—come with us,
With your basket and your rod;
And with happy hearts look up from
Nature unto Nature's God.

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CHAPTER II.

THE GENERAL HISTORY OF ANGLING, TACKLE, AND BAITS.

WAS Adam an angler? Did he solace himself in the intervals of his delightful work *in medio ligni paradisi*—in the midst of the trees of the garden—with luring the beauties of the four rivers—Gihon, Pison, Hiddekel, and Euphrates? or was angling a pleasure not then included in the plan of human happiness? It boots not to know the answers to these questions, and they may well be passed over, but it may be interesting to my readers to have a slight sketch before them of the general rise and progress of angling from early times, that when I come to an enumeration and consideration of the exigencies and appliances of the art in future chapters they may in some sort compare the ancient fishing with that of to-day.

It has been presumed, and certainly the presumption seems to hold good, that the ancient Egyptians were not only catchers of fish, but artistic anglers also. Certain figures on their monuments clearly exhibit their knowledge of the craft. The Greeks also appear to have had some knowledge of it also; witness a passage in Homer, in which he speaks

> Of beetling rocks that overhang the flood,
> Where silent angler cast invidious food,
> With fraudful care await the finny prize,
> And sudden lift it quivering to the skies.

Certainly the idea of throwing the fish over one's head does not represent the method of the angler to the best of advantage, but the reference is distinct enough. The Bible furnishes other undeniable references to angling, and, if I am not mistaken, in the Book of Job we find the first reference to the using of a hook: "Canst thou draw out the leviathan with an *hook*; canst thou bore his jaw through with a *thorn*?" Again, in Isaiah, chap. 19, v. 8: "And the fisher shall mourn and lament, and those that cast the *hook* into the river." The word *hook* is here, I am informed by a celebrated Hebrew scholar, properly

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rendered. Also amongst the results of excavations at Pompeii were some hooks of a rude shape, of bronze, that is, of an alloy of tin and copper most probably, which, as Pliny informs us, could be drawn out to the thinness of a hair.

Of course the Romans and Greeks of a more recent time were well acquainted with the art, and we need but glance at Oppian to be sure that these antiquated anglers belong in spirit to the present commonwealth of fishermen. His spirited description of gorge fishing and the capture of the quarry, when done into good English verse, is generally much superior to any such descriptions in modern time except those of Gay. Nor may we forget the story of Antony and Cleopatra and the irritating trick her Majesty played her Roman lover when they went a-fishing. Plutarch gives the incident thus: "It would be very tedious and trifling to recount all his follies, but his (Antony's) fishing must not be forgot. He went out one day to angle with Cleopatra, and being so unfortunate as to catch nothing in the presence of his mistress, he was very much vexed, and gave secret orders to the fishermen to dive under the water and put fishes that had been fresh taken upon his hook. After he had drawn up two or three, Cleopatra perceived the trick; she, however, pretended to be surprised at his good fortune and dexterity, told it to all her friends, and invited them to come and see him fish the next day. Accordingly, a very large company went out in the fishing vessels, and as soon as Antony had let down the line she commanded one of her servants to be beforehand with Antony's, and, diving into the water, to fix upon his hook a salted fish, one of those which were brought from the Euxine Sea." This is perhaps one of the most delicious of piscatorial jokes, and Plutarch tells it well, but not so well as Shakspeare. The immortal Swan of Avon thus translates it:

CLEO: Give me mine angle; we'll to the river; there,
My music playing far off, I will betray
Tawny finned fishes; my bended hook shall pierce
Their slimy jaws, and as I draw them up
I'll think them everyone an Antony,
And say, Ah! ah! you're caught.
CHAR: 'Twas merry when
You wagered on your angler, when your diver
Did bring a salt fish on your hook which he
With fervency drew up.
CLEO: That time! O times!
I laughed him out of patience.

Dr. Badham also, amongst other very amusing and interesting little narratives of ancient angling, transcribes a passage from Ælian in reference to the Macedonian catching a speckled fish by means of a fly. This I shall refer to further when speaking of baits, but it sufficiently shows that angling was practised widely amongst the ancient civilised nations.

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More nearly approaching our own times, it would appear that the ancient Britons and their successors, the Anglo-Saxons, were not very accomplished in the capture of fish either for food or sport. Thus Bede tells of the people of Sussex that "The Bishop (Wilfrid) when he came into this province, and found so great a misery of famine, taught them to get their food by fishing. Their sea and rivers abounded in fish, yet the people had no skill to take them, except only eels. The bishop's men having gathered eel nets everywhere, cast them into the sea, and by the help of God took three hundred fishes of several sorts, the which, being divided into three parts, they gave a hundred to the poor, a hundred to those of whom they had the nets, and kept a hundred for their own use."

In the interim, between this period and the publishing of the first book on fishing (commonly known as the "dark ages," albeit not nearly so black as has been painted), there is evidence that the people became much more educated in the ways of fishes and, presumably, also in the ways of taking them. The remains of monastic institutions indicate the existence of a species of fish culture which is hardly surpassed by the fish culture of to-day. At Stanton Harcourt, for example, there are still to be seen, according to Mr. Francis Francis, dried up stews of such fashion as to demonstrate at once their former uses. "No doubt," he says, "many a noble tench, fat carp, and luscious eel, made rich and savoury by all the varied recipes of monastic cookery, humbled the bereaved stomachs and mortified the flesh of abbot and friar and reverend prior at Stanton Harcourt in days gone by."

As if to lend countenance to the supposition that the monks were the chief anglers in Britain during its early history, we find that the first book printed in this land on the subject was by the Prioress of St. Albans, Juliana Barnes, or Berners. Indeed, it may also claim to be amongst the first books printed in England, for not ten years after Caxton printed his first book Wynkyn de Worde published the so-called "Book of St. Albans." This first appeared in the world in 1486, and contained treatises on various other sports; but that with which we are at present concerned began thus: "Here begynnyth the treatyse of fysshyne wyth an angle." The directions therein given are very primitive, but were probably sufficient for the fish in these times. This book went through eleven editions, combined with the other treatises before mentioned. Thereafter followed during the succeeding century no book on the gentle craft of which we have any record. Leonard Mascall certainly brought out a book in 1590 "which contains but little improvement on the Book of St. Albans." In 1651 Barker's quaint "Art of Angling" appeared, and may be said to have laid the foundation of all future angling, it containing much practical observation and not a few hints of real value

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to the tyro. Walton, in 1653, published his "Complete Angler," which, as all readers are aware, has not been surpassed by any to this time for its unfeigned enthusiasm in reference to matters piscatorial and the ardent love of nature shown on every page.

The art of fishing at the time of the production of this book was at a low standard, compared with its present position as an art, nevertheless there is very little in Walton's book to be repudiated, and many of his angling "wrinkles" are replete with a true knowledge of the habits of fish. Indeed, it is this latter quality which renders the book of value to the angler, and as an example I am bold enough to assert that the description of the habits of the trout is, as a piece of real ichthyological knowledge, not surpassed by any succeeding writer.

To show the difference between some ancient ideas in reference to the proper times for angling and our own ideas, I may be allowed to quote from an old book in my possession (without a title page), which is probably a compilation with a little superadded matter from Gervase Markham or Leonard Mascall, in reference to the bearing which astrology was supposed to have had on angling. This old author thus gives his opinions, under the title of "Astrological Elections for Angling in General": "If, as the wise man saith (and I think that there is none which dare question his authority) that there is a proper time and season for every action under the sun, I hope it will not be offensive nor impertinent to show what time and seasons the intelligent angler ought to make choice of that may answer his expectation. For my part I have so often experienced the truth of these rules, that by good will I would never angle but at an elected time; the ingenious will not despise them, and for others .they are not intended. And they are these:

If you would Neptune's scaly subjects get,
Night's horned queen in the mid heaven set,
Thence let her in the Paphian goddess shine
I' th' west, and greet her with a friendly time.
Be sure you always fortify the east,
And let the maiden star possess the west.
However, let some aquatick sign ascend,
And let all power his happy lord attend;
Then see the setting constellation be
Afflicted by some hateful enemy.
At least his lord the sixth with strength defend,
Let active power his radiant lord attend;
Then you may boldly venture to the flood,
And take from thence what fishes you see good.

The reader skilled in the use of the astrologe may be able to elucidate this quaint piece of rhyme, but I confess I am not. The directions of a modern author in reference to the best fishing weather are briefly given for comparison, and serve to show how the art has been reduced to simple unequivocal rules from observations of weather chiefly unconnected with the stellar worlds. Ronalds, in the "Flyfishers'

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Entomology," says: "The best days to select for fly-fishing are warm and cloudy, with a gentle breeze from south or west, causing a ripple on the water, by which the fish is not only prevented from seeing the fisherman so plainly as in smooth water, but is also deprived of so good an opportunity of detecting the fly-maker's artifice. The water after a flood is sometimes for several days too turbid for fly-fishing. When it is very low in its bed and clear, the circumstances are also unpropitious, and success is obtained with difficulty. When the water is unusually high, though the water be not discoloured, the fish seem to be feeding more at the bottom than above." This, of course, applies chiefly to fly-fishing; but I have thought fit to reproduce it because it seems to me to show how the tendency of modern angler wisdom is to reduce to simple rules all the ancient jargon of fishing unwisdom, and to seek success through a thoroughly scientific deduction from incontrovertible observation of Nature's self.

The alteration in the making and general appearance of tackle is even more marked than the change in the general attitude of anglers in reference to the art. It is true that according to Ælian, as quoted by Dr. Badham, the Macedonians were in the habit of making an artificial fly to imitate the "hippurus," whatever that might have been, with which they caught the "speckled" beauties referred to above, and that this imitation was subtly done there may reasonably be little doubt; but in England it was very different in the earlier age of the art of tackle making. The gorge hook of Nobbes, for example, is figured in his book like unto a dragon's tail, and armed with stiff wire, inflexible, and leaded; but the latest gorge hook, as shown in the chapter on "pike," is a much finer affair; the flight, again, and the live bait tackle, have been of late years so modified as to be scarcely recognisable as of the same genera as that of fifty years ago. Similarly, the rod has undergone a great alteration. Dame Juliana Berners speaks of using an ash pole, which appears to have been of considerable dimensions. In contrast to this, one of the latest improvement in manufactured rods is the American spliced rod, which consists of six or nine pieces of the finest bamboo, in sections, which are sawed with mathematical precision, and then whipped with silk at intervals of half an inch; these are extremely handsome and beautifully light: the top is generally of lance wood.

Again, what a difference is now made in the portableness of tackle! The old author to whom I have just referred speaks of carrying a plummet, a whetstone to sharpen blunt hooks, and concludes: "I need not advise you how to carry your bob and palmer, or put you in mind of having several boxes of divers sizes for your hooks, corks, silk thread, lead, flies, or admonish you not to forget your

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linen and woollen bags for all sorts of baits, but let me forewarn you not to have a pannier that is heavy, for it can never be light enough." Don't forget, he says, to carry a landing net, and also hooks to cut away the reeds, &c. At this time all the multitudinous carrying referred to can be dispensed with, and the latest invention I hear of is a *hat* which will carry all necessaries. This will be rendered water-proof by a macintosh covering, and all the angler's "tools and baytes" will therefore be upon his own head.

Some extraordinary compounds have been from time to time used as bait. Perhaps this is not to be wondered at. The fact that fish possessed the sense of smell or taste in a refined degree was known to the early anglers, and in the days when men were eagerly seeking for the philosopher's stone, and endeavouring to transmute the baser metals into gold, alchemical preparations might easily have been supposed by such philosophers capable of potently influencing the piscine mind to its destruction. Whether such preparations are really of use I shall examine further on; in the meantime a few of these magical prescriptions may be referred to in detail.

The practice of using drugs in fishing is respectably ancient. Oppian speaks of myrrh dissolved in wine lees. The passage has thus been translated:

> A paste in luscious wine the captor steeps,
> Mixed with the balmy tears that Myrrha weeps;
> Around the trap diffusive fragrance rolls,
> And c lls with certain charms the finny shoals;
> They crowd the arch, and soon each joyful swain
> Finds nor his labour nor his care in vain.

He also further refers to some kind of Æsculapian nostrum which the fishermen turned to account by impregnating their nets with it. Unguents and pastes were also increased in efficacy by the admixture of various chemicals. Pliny records the aromatic odour of aristolochias, and speaks of its similar use. He also refers to a vegetable growth called popularly the "earth's poison," and says it was successfully used by the Campanian fishermen. "I have seen them use the plant," he says, "incorporating it with lime, and throwing detached pellets into the sea, one of which was no sooner swallowed than the fish, immediately turning over, floated up dead. But the most interesting of these poisons is unquestionably prepared from the cyclamen or sow bread, two species of which possess the property of drugging fish in a remarkable degree, the *C. hederæfolium* and the *C. Neapolitanum*. The lazzaroni, from whom we first learnt the qualities of this plant, stated that they were in the habit of mixing it with other ingredients in a paste, called the *lateragua*, which is either then thrown in lumps from a boat, or enclosed in a bag and thrust, by means

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of a long pole, among the rocks, when, if any fish are within smell, the crew are sure of a good haul. It was found, they said, particularly successful in the capture of cephali, and generally of low swimming fish, whose nostrils come in more immediate contact with the ground." The botanical correctness of this passage has been proved.

But if the so-called ancients were fastidious and curious in the manufacture of their baits, what will be said of the early fathers of English angling in this respect? "I make," says one who fished in the 15th century, "but little boast of my unguents; for there are those about who would steal of my secrets and lie in wait, abounding like a robber for that which I use, that they the whereof could take to the man of cunning and set aside each of its components, and thus become master of that which is none of theirs; but this I will venture, for none such purloiners of man's goods is there even the most simple of pastes left for that being made of white bread and milk *needeth clean hands.*" Is not this a "palpable hit," good reader?

Clearly, from the passage the old fisherman was cunning in the preparation of his fantastic lures. Perhaps the following mixture, given by another writer, was one of the stolen secrets: "Assafœtida, oil of polypody of the oak, oil of ivy, oil of peter, and gum ivy mixed as a paste." By the way, of all horrid fœtid stinks, I think assafœtida is the most sickly, and how it ever could be imagined that fish would take kindly to it, when some will reject with scorn the reeking brandling or stale lobworm, is beyond my comprehension. Polypody of the oak is scarcely less nasty. The oil of ivy is not so offensive, and is the sap or exudation of the ivy stem. What oil of peter is, unless it is oil of St. Peter's wort, I am not chemist enough to determine. For curiosity's sake I once made up the mess, minus "oil of peter" and found it not only unspeakably offensive but unsuccessful to boot. But to proceed. Even still more wonderful and mystical ingredients are recorded as efficacious in the capture of fish. Thus Mons. Charras, Apothecary Royal to Louis XIV., left behind this recondite prescription: "Take of *man's* fat and cat's fat of each ½oz.; *mummy*, finely powdered, 3 drachms; cummin seed, finely powdered, 1 drachm; distilled oil of aniseed and spike, of each 6 drops; civet, 2 grains; and camphire, 4 grains. Make an ointment according to art. When you angle with this, anoint 8in. of line next the hook." We are informed that the "*man's*" fat can be got at any surgeon's, but where the 3 drachms of "*mummy*" can be procured I do not know. There must have been some imagined or real virtue in the corporeal body of man or its remains, else why these directions? "Take the bones or skull

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of a dead man at the opening of a grave and beat them into powder and put of this powder in the moss wherein you keep your worms; others like the grave earth as well." To what base uses we may return! Why may not imagination trace the noble dust of Alexander to feeding fish—an even stranger use than "stopping a bung hole." One is reminded on reading these queer recipes of the moody Prince of Denmark, "A man may fish with the worm that hath eat of a king, and eat of the fish that hath fed of that worm." Fat from a heron's leg is also recommended, and I heard quite lately an old and accomplished angler assert that if this fat of the heron's leg—it would require a good many herons' legs to furnish an ounce of fat—be incorporated with bread paste, the result is glorious, the roach cannot resist the seductive grease, and one has almost to engage a strong boy with a thick stick to enforce their coming one at a time. Here also is an unguent which is recommended, even so late as 1740, by John Richardson, gent., for attracting "trout in a muddy water" and gudgeons in a "clear stream:" assafœtida 3dr., camphire 1dr., Venice turpentine 1dr., heat together with some drops of the chemical oil of lavender and camomile of each an equal quantity. Need I say that it has not the desired effect? Truly it may, however, be said of the angling of other generations:

> All arts, all shapes, the wily angler tries
> To cloak his fraud and tempt his finny prize,
> Their sight, their smell he carefully explores,
> And blends the druggists' and the chemists' stores,
> Devising still with fancy ever new
> Pastes, oils, and unguents of each scent and hue.

The reader will observe that I have contemptuously spoken of the recipes given by old writers for the preparation of baits. This is justifiable, for no man in his senses could credit in these later days the absurdities connected with human and feline adipose or the asserted potency of oil of polypody and assafœtida. Yet there is "something in it." All ancient crazes (unlike many modern ones) have a grain or more of sure foundation; they, it is true, sometimes appear like inverted pyramids, but nevertheless they rest on something. So also the idea of scented and coloured baits arises from an exaggerated idea of the senses of fishes. We cannot now credit fish with a preference for "oil of whelps" (*i.e.*, puppies boiled in oil), but we are obliged to credit the statement which old fishermen make relative to the attractiveness of "oil of worms" (*i.e.*, worms placed in a bottle and covered up in a dung heap till decomposed) to eels. Next to assafœtida the smell of this "oil" is the most offensive, but I have practically tried it and tested its efficacy when smeared on the inside of the "eel pot" or basket. Aniseed also is attractive, without question, on occasions.

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Against these conclusions an eminent authority is, however, set. Ronalds, from his observatory by the side of the Cottonian Dove, whilst acknowledging the difficulty of coming to precise conclusions without blinding the fish, gives some very unequivocal results of experiments on the taste and smell of trout. I am sure I shall be forgiven if I reproduce what he says in reference to this question, for, although it is an interesting ichthyological question, we nevertheless cannot dismiss the history of fancy baits without showing their truth or falsehood. "I once threw upon the water," he remarks, "by blowing through a tin tube successively ten dead house flies towards a trout known to me by a white mark on his nose (occasioned by the wound of a hook), all of which he took. Thirty more, with *cayenne pepper and mustard* plastered on the least conspicuous parts of them, were then administered in the same manner. These he also seized, twenty of them the instant they touched the water, and not allowing time for the dressing to be dispersed, but the other ten remained a second or two upon the surface before he swallowed, and a small portion of the dressing parted and sank. The next morning several exactly similar doses were taken by the same fish, who probably remembered the previous day's repast, and seemed to enjoy them heartily. From these and similar experiments, such as getting trout to take flies dipped in honey, oil, vinegar, &c., I concluded that if the animal has taste (or smell ?) his palate is not *particularly sensitive*." Again, M. Dameril, of the French Institute, on careful investigation, was led to believe that the sensation of taste or some equivalent sensation "is imparted to them by the apparatus which has hitherto been considered as adapted to receive the emanations of odorate bodies, and that no real smell can be perceived in water."

These authorities notwithstanding, I am obliged to believe, from hundreds of observations of fish when feeding, the enumeration of one-tenth part of which would be out of place and tedious here, that fish do possess a sense, a perception—call it what you will—which is independent of sight, although of course greatly aided by it. We are told by scientists that odour is due to a mechanical emanation of particles from the substance which we commonly deem is itself odorous. Why these multitudinous and infinitesimally minute particles cannot mechanically affect, though perhaps in a lesser degree, the olfactory nerves in a fish it is hard to say. I am inclined to believe they are given off, and do permeate between the grosser atoms of water, and reaching the duller nerves of sensation, do cause a perception of greater or lesser intensity. Taste probably has something to

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do with the selection of food also, but I am inclined to think that the sense of taste is not very sensitive, and chiefly resides in the lower part of the palate of the fish. It is not at all unfrequent for a fish to disgorge the food which has partly entered the stomach, but I think it is quite impossible for it to disgorge anything which has once actually been enveloped by the maw. I have caught trout with stones in them, and, like the omnivorous ostrich, they seemed to have flourished with this stomachic foundation, but would they not have ejected them had they the power?

But enough of this aspect of the question. Bait, as used in these days, partakes very little of the fanciful nature of old preparations, and goes to no greater extremes than a green pea or ripe cherry for a carp, or cheese for chub. Even the deadly salmon roe is interdicted on the novel ground (to the ancient angler) that it is too killing. Cocculus indicus—which Best, in his "Arcana in the Art of Angling," naively says is called also *Baccæ piscatoriæ* (fishers' berries)—is forbidden, and the "white net," or bottle of lime, is a rank "black art" of the poacher. The angler at present fishes *au naturel*, with Nature's baits for the most part, and when he condescends to vary these he intersperses mechanical niceties in the shape of imitations rather than chemical abominations abhorrent of modern fish.

Baits are of two great classes, alive and dead. The live baits are, briefly, small fish, frogs, worms, gentles, and, in some rare instances, it may be worth while using a live fly, such as a cockchafer. On the score of humanity, live bait fishing, perhaps, does not produce pleasure so unalloyed as that demanding the use of dead baits only, but it may be safely said that live bait fishing is incomparably more effectual in the majority of cases. The dead baits include pastes and vegetables and artificial baits. At the present time the humane angler, who shrinks from impaling a worm, gentle, or fish, can make or use an imitation, which is easily made, as shown in the chapters on Tackle Making.

A few remarks anent the subject of baits and ground-baiting may appropriately terminate the general history of the art and its adjuncts. In selecting live bait, let the angler chiefly choose those of the hardier sort, such as gudgeon, minnows, dace, rudd. In transporting them from place to place, six to a gallon of water in summer, and ten in winter, of medium sized fish, are quite enough for a moderate journey; if a *little* water can be added occasionally the chance of their arriving healthy is increased. Bait killed and a little salt strewn over them, and then packed in bran, will keep for days

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and continue tough. Worms should in all cases be stored in moss, cleaned and sorted every week in cold, and twice or three times per week in warm weather. Gentles can be kept during the winter by burying under ground in a warm position. These are hints by the way.

Ground baits should be of like character to the hook bait intended to be used. This should be a *sine quâ non*. If one ground baits with worms one should select of the cleanest worms for the hook. Similarly, if one baits with common gentles, the finest gentles from animal's liver should be used. A little ground bait should only be thrown in, sufficient to tempt the fish to the particular locality. A little should be also thrown in during fishing. Greaves, potatoes, bread, even boiled Indian corn and pearl barley, all make splendid ground baits as occasion requires; but, above all, the angler should be careful not to be too copious in his baitings nor fish too closely in time on such preparation.

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CHAPTER III.

NOTES ON ICHTHYOLOGY, OR THE SCIENCE OF FISHES.

THE practical angler is all the more likely to obtain sport if he understand thoroughly the habits of his quarry. Similarly other sportsmen are more likely to be successful when they are possessed of analogous knowledge. Of course when stating these platitudes I am not about to draw the inference that technical knowledge is alone sufficient. It is possible for a man to be able to enumerate the characteristics of a far-off country, and yet were he deposited in its midst by virtue of Aladdin's lamp or some other magical emigration agency, he very probably would not recognise the land. In like manner more than one learned pundit in piscine anatomy has never caught a salmon, and only knows its habits in theory. It, therefore, is not likely that a chapter on ichthyology will make a fisherman, although the theory, combined as it should be with practice, will probably advance the angler considerably before his uneducated compeers in the gentle craft. A competent knowledge also of ichthyology is useful to the traveller angler in other lands, and the exquisite wonders of the fresh water and ocean become additionally attractive when the angler-naturalist can with the certainty afforded by a few distinct and well defined rules settle the family, if not the species, of a new or novel capture.

The various remarks I shall make in this chapter will be as practical as possible, and I shall avoid introducing matter which is not necessary to the fresh-water angler in the connection indicated. The wonders of our native waters are manifold, but the practical angler, much as he may appreciate the acquirement of knowledge, will not thank me for a long dissertation on the monsters of the ocean and the curious habits they make manifest. The "divine" Du Bartus, as Walton calls him, has sufficiently spoken of the extraordinary marine animals, and further than

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his quaint enumeration of them I shall not at this moment go. He says :

> God quickened in the sea and in the rivers
> So many fishes of so many features,
> That in the waters we may see all creatures,
> Even all that in the earth are to be found,
> As if the world were in deep waters drowned;
> For seas as well as skies have sun, moon, stars,
> As well as air, swallows, rooks, and stares;
> As well as earth, vines, roses, nettles, melons,
> Mushrooms, pinks, gilliflowers, and many millions
> Of other plants more rare, more strange than these
> As very fishes living in the seas;
> As also rams, calves, horses, hares and hogs,
> Wolves, urchins, lions, elephants, and dogs;
> Yea, men and maids, and which I most admire,
> The mitred bishop and the cowlèd friar,
> Of which examples but a few years since
> Were shown the Norway and Polonian prince.

Of course this curious old devout is remarkably figurative, and the excerpt from his "Contemplation" is only introduced as a curiosity; nevertheless, however, the similitudes he traces are not all in vain, and even in fresh water some not less interesting creatures are resident, although mermaids and "mitred priest and cowlèd friar" may not there be found.

The whole of the British fresh-water fishes are included in four orders and embraced in seven families. I cannot do better than give a list of them as arranged by Mr. Pennell in his "Angler Naturalist" after Cuvier. It runs as follows :

CLASSIFICATION OF BRITISH FRESH-WATER FISH.

1st Series. True, or Bony Fish.

Order I. SPINY-FINNED FISH.

Family 1. Perches—Percidæ.

Species.

Perch. (*Perca fluviatilis.*)
Ruffe, or Pope. (*Acerina vulgaris.*)

Family 2. Fish with hard Cheeks.

Species.

Bullhead, or Miller's Thumb. (*Cottus gobio.*)
Rough-tailed Stickleback. (*Gasterosteus trachurus.*)
Half-armed Stickleback. (*Gasterosteus semiarmatus.*)
Smooth-tailed Stickleback. (*Gasterosteus leiurus.*)
Short-spined Stickleback. (*Gasterosteus brachycentrus.*)
Four-spined Stickleback. (*Gasterosteus spinulosus.*)
Ten-spined Stickleback. (*Gasterosteus pungitius.*)

Order II. SOFT-FINNED FISH with ventral fins on the belly.

Family 1. Carps—Cyprinidæ.

Species,

Common Carp. (*Cyprinus carpio.*)
Crucian, or German Carp. (*Cyprinus carassius.*)
Prussian, or Gibel, Carp. (*Cyprinus gibelio.*)
Gold Carp. (*Cyprinus auratus.*)
Barbel. (*Barbus vulgaris.*)
Gudgeon. (*Gobio fluviatilis.*)
Tench. (*Tinca vulgaris.*)
Bream, or Carp Bream. (*Abramis brama.*)
White Bream, or Bream-flat. (*Abramis blicca.*)
Pomeranian Bream. (*Abramis Buggenhagii.*)
Dace. (*Leuciscus vulgaris.*)
Roach. (*Leuciscus rutilus.*)
Double Roach. (*Leuciscus dobula.*)

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Order II. Family 1—*continued.*
Species.
Chub. (*Leuciscus cephalus.*)
Ide. (*Leuciscus idus.*)
Graining. (*Leuciscus Lancastriensis.*)
Red-eye, or Rudd. (*Leuciscus erythrophthalmus.*)
Azurine. (*Leuciscus cæruleus.*)
Bleak. (*Leuciscus alburnus.*)
Minnow. (*Leuciscus phoxinus.*)
Loach. (*Cobitis barbatula.*)
Spined Loach, or Groundling. (*Cobitis tænia*).
Family 2. Pikes—ESOCIDÆ.
Species.
Common Pike, or Jack. (*Esox lucius.*)
Family 4. Salmon and Trout—SALMONIDÆ.
Species.
Salmon. (*Salmo salar.*)
Bull Trout. (Grey Trout, Sewin, or Roundtail.) (*Salmo eriox.*)
Salmon Trout. (*Salmo trutta.*)
Common Trout. (*Salmo fario.*)
Great Lake Trout. (*Salmo ferox*).
Loch Leven Trout. (*Salmo levenensis.*)
Charrs.
Grayling. (*Thymallus vulgaris.*)
Gwyniad. (*Coregonus Pennanti.*)
Powan. (*Coregonus Cepedei.*)
Pollan. (*Coregonus pollan.*)
Vendace or Vendis. (*Corregonus Willughbii.*)

Order III. SOFT-FINNED FISH having lower arms.
Family 1. Cod—GADIDÆ.
Species.
Burbot, or Eel-pout. (*Lota vulgaris.*)

Order IV. SOFT-FINNED FISH lacking ventral fins.
Family 1. Eels—MURÆNIDÆ.
Species.
Sharp-nosed Eel. (*Anguilla acutirostris.*)
Broad-nosed Eel. (*Anguilla latirostris.*)
Snig. (*Anguilla mediorostris.*)

2ND SERIES. CARTILAGINOUS FISH.

Order II. FISH WITH FIXED GILLS.
Family 1. Fish with mouth formed into a sucker—CYCLOSTOMATA.
Species.
Lamprey, or Sea Lamprey. (*Petromyzon marinus.*)
Lampern, or River Lamprey. (*Petromyzon fluviatilis.*)
Fringed-lipped Lampern. (*Petromyzon Planeri.*)

An example of the above may be thus written. The Perch is a fish of the first series of true or bony fish, of the first order of Acanthopterygian or spiny-finned fishes of the first family of Perches (*percidæ*) and of the species *Perca fluviatilis*. Another example may be further written with advantage that no possible difficulty may be experienced by the reader in understanding the classification given. Thus the common Carp is also of the first series of true or bony fish (as distinct from the cartilaginous, instance lamprey), but of the second order of soft-fined with ventral fins on body, or *Malacopterygia adominales*, and its species is *Cyprinus carpio*.

As will be perceived, the chief difference between the commonest fresh-water fishes is the absence or presence of spines in the fins. If when the absolute novice takes a fish he first examines the fins and finds it has spines and no ventral fins, he has determined, if he have the

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above table in his memory—first, that it belongs to the true fish as distinct from cartilaginous (for no cartilaginous fish can have spines); second, that it belongs to first order of spiny finned fishes or Acanthopterigians; and, thirdly, if it has spines on the back, it is of the percidæ family. Herein lies one of the practical uses of ichthyology. The determination of the different *genera* in the same genus of fishes requires more minute and careful comparison than a decision of the order. The tyro, for example, would probably find it difficult to instantly distinguish between the dace and chub, and, indeed, when both are young, the difference is infinitesimal. As I intend to revert to each fish in the order above given, I shall reserve any further remarks on the distinctive characteristics of each until that time.

It may now be well to consider in a succinct manner the various principal qualities and attributes which fish have in common. First, then, if we disregard the idea which has obtained in reference to eels being viviparous, or bringing forth their young alive, it may be stated that, in scientific phraseology, all fish are oviparous vertebrata, or creatures with articulated backbones bringing forth eggs. They have a double circulation, and breathe through the medium of water. Like other animals of the same class, they have a spinal column formed of four parallel sections, two of which receive nerves of sensation from the surface of the body, and the other receive the nerves of volition or action. The spinal cord enlarges at one end of this column and forms the brain, which in the pike is in weight as 1 in 3000 in proportion to the body, and in carp (the subtlest of the soft-finned fish) as 1 in 500.

The *Branchia* or gills, or breathing apparatus, are, as need scarcely be stated, compactly arranged in the opercula or gill covers of the creature, and consists of four or five cartilaginous fringed arches. Under the microscope these present a very beautiful appearance, as they continue their work, receiving the water, separating the air from it, and passing it on through the anterior opening, together with whatever of carbon is given off. And here it is worthy of remark that the water is not decomposed, but the oxygen is only mechanically separated from the water. A fish cannot live in a tumbler of water placed in the receiver of an air pump. Some fish will, however, continue to live out of water a considerable time. In the ordinary way the gill filaments get stuck together as they dry, and the fish then becomes asphyxiated and dies.

The *fins* of a fish serve variously in the different families and species. Generally speaking the following description of their functions is a correct one. I extract it from "Paley's Natural Theology," (the author of which probably got it chiefly from Goldsmith's "History of Animated

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Nature,") because it states the results of experiments, which I have myself repeated, better than any words of mine could do. It says that in most fish "beside the great fin the tail, we find two pairs of fins upon the sides, two single fins upon the back and one upon the belly, or rather between the belly and the tail. The balancing use of these organs is proved in this manner: of the large-headed fish, if you cut off the pectoral fins, *i. e.*, the pair which lies close behind the gills, the head falls prone to the bottom; if the right pectoral fin only be cut off, the fish leans to that side; if the ventral fin on the same side be cut away, then it loses its equilibrium entirely; if the dorsal and ventral fins be cut off, the fish reels to the right and left. When the fish dies, that is, when the fins cease to play, the belly turns upwards. The use of the same parts for motion is seen in the following observation upon them when put in action. The pectoral, and more particularly the ventral, fins serve to raise and depress the fish; when the fish desire to have a retrograde motion, a stroke forward with the pectoral fin effectually produces it; if the fish desire to turn either way, a single blow with the tail the opposite way sends it round at once; if the tail strike both ways, the motion produced by the double lash is progressive, and enables the fish to dart forwards with an astonishing velocity. The result is not only in some cases the most rapid, but in all cases the most gentle, pliant, easy, animal motion with which we are acquainted. However, when the tail is cut off the fish loses all motion, and gives itself up to where the water impels it. The rest of the fins, therefore, so far as respects motion, seem to be merely subsidiary to this. In their mechanical use, the anal fin may be reckoned the keel, the ventral fins the outriggers, the pectoral muscles the oars, and if there be any similitude between these parts of a boat and a fish, observe that it is not the resemblance of imitation, but the likeness which arises from applying similar mechanical means to the same purpose."

In reference to the foregoing, one error needs correction, and one observation may be added. The error is in asserting that if the tail be lost in the fish it loses all motion. This it does not do. The posterior parts are still exercised as if the tail still remained, and the resulting movement is what anglers term a "wobble," but, nevertheless, a progressive movement. The addition is one the truth of which anyone may verify by watching the progression of the sticklebacks in a tank at the Royal Westminster Aquarium. The fish distinctly advance by a series of jerks caused by the pectoral fins. The tail has nothing to do with progression, and seems only to make a quivering movement to maintain equilibrium. I know of no other fresh-water fish with the same peculiarity.

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The *scales* of a fish are for the purpose probably of defending it from its enemies in the way of associates of a vegetable or animal parasitic or devouring nature. If one be lost, it is again supplied in a manner similar to the supply of a lost nail in the human being. Glands are situated under the so-called lateral line and on the head of the fish, and from them a sort of varnish of mucus is perspired, without which fish cannot live long. When from any cause the supply fails, parasitic growths make their appearance, and after them malignant ulcers, and finally death. Roach about spawning time are usually rough and devoid of a plentiful supply. The roughness is caused by a sort of loosening of the scales. This soon after the deposition of ova, however, subsides, and an abundance of mucus makes it very unpleasant to handle the fish at all. The scales of fishes are divided into four classes, which are termed by Agassus—*cycloid*, from the Greek *eidos*, resemblance, and *cyclos* the circle; *ctenoid*, from *ctenis*, a rake; *ganoid*, from *ganos*, brilliancy; and *placoid*, from *plax*, a flat level surface.

Now as to the senses of fishes, which, after all, is to anglers the most important consideration of all.

First I will advert to *sight*. This is, unquestionably, the best developed sense in fishes, especially in the game fishes. In fish the eyes are variously placed, some having them so situated that a forward, backward, upward, and downward movement may be made, as in some of the carp family bred by the Chinese, termed "telescope" fish; in others, such as trout, the sight is vastly more developed, but the movement of the eye is more confined, hence I do not think a trout can see back, and in the case of the pike, where the prey is seized chiefly above the destroyer near the surface, the eyes are near the top of the head, and I opine and have seen nothing to alter the opinion, that the pike cannot, without great exertion and an anomalous arrangement of position, pick a bait from the bottom of the water. The angler may be quite sure that when he can see a fish that fish can invariably see him. An interesting question has recently arisen in an American sporting paper as to "colour" blindness in trout of certain waters. I am disposed to believe, without *here* giving my reasons for it, that in some cases trout are afflicted, if not with colour blindness, with certainly an unreasonable and unaccountable desire for a certain hue which rarely, but in some cases, disappears. I shall, however, discuss the matter in the chapter on Trout.

The senses of *smell* and *taste* have been referred to to some extent in a recent chapter, wherein I touched on the subject of baits, and need little, if any, further consideration. Whilst I concede the power of smelling to be tolerably acute, I am convinced that the sense of taste is very imperfect. Mr. Pennell gives as a reason for believing that fish have a

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poor power of palate, the fact that they are "often unable to distinguish *poisonous* substances, and are frequently accordingly destroyed wholesale by poachers." It seems to me that these are very insufficient grounds for assuming an absence of taste. I doubt not but that I or the nearest druggist could compound savoury but fatal dishes *ad infinitum*, and even Mr. Pennell's educated palate would fail to distinguish the poisonous agent. However, he is quite right in the assertion which follows, that the sense of taste (if it amount to that) is more developed in herbivorous than in carnivorous fishes.

The sense of *feeling*, or mechanical perception, is without doubt also but feebly developed, except in such fish as the *Silurus glanis*, and generally barbed or bearded fishes, such as the barbel and gudgeon. In these the sense of sight is in many cases imperfectly developed, and the tentacula are as auxilliaries brought into requisition. The sense of feeling in its subjective aspect is also feeble. A shark, Mr. Pennell tells us, will be seemingly unconscious of serious injury unless it is disabled, and we know how trout will take a hook in its mouth, and a pike a gorge bait with treble hooks in its mouth and another hook and half digested lead in its stomach. Mr. Pennell once caught a perch with its own eye; and this incident reminds me that on one occasion I performed the operation on a large tame carp of cutting its eye from its head, from which it hung suspended by the optic nerve—having been partially torn out. The carp the same evening responded to its keeper's whistle to be fed, and did feed.

Speaking of calling fish reminds me of the final sense on which it is here necessary specifically to remark, viz., *hearing*. That fish do hear is undoubted; but the medium of the water being denser the sound made in air is not heard, I believe, in water unless it be sufficiently loud to produce well-defined mechanical vibrations in the water. For example, one may speak as loudly as inclined in the punt within a few yards of a wily old chub, but no result is apparent. The fish whose sight is so keen and whose fears are so instantly aroused as to perceive in the shadow of a flying bird an enemy, cannot hear the reverberation of the voice—for this assumption is fair from its timorous character; but fire off a gun near it as I have done, hidden so that no smoke or flame can be possibly seen by the fish, and away darts *Cyprinus cephalus* to deep water. Again, I have seen the small fish leap bodily out of the water on the firing of a frigate's 24-pounder. Of course I know that these results are substantially denied by Ronalds in his book, but I can conceive of his experiments being faulty, and his gun of light detonation, both of which possible causes of his opinions could not have operated in my own experiments. Again, notwithstanding my experience, I am confronted by the fact that persons whistle and call

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tame carp. How shall we get out of the dilemma? I invite the reader to try experiments himself.

So far I have spoken of sounds made in the air being practically unheard in the water. Now for a different aspect of the affair. The chub of which I spoke above did not perceive your voice when you shouted without materially moving yourself; but assume that he is in the same position, and stamp your foot on the floor of the punt, the chub disappears instantly, and the angler cannot get him to return that day at least. The deduction is evident, and when fishing the tyro should bear in mind that it is infinitely worse to stamp the feet or move about in the punt or walk heavily on the bank than to talk or sing or whistle. Sound made on the surface or in water travels for miles, and fish in a well-fished river know the difference between sounds as well as the angler.

Growing out of the above remarks are various questions of great interest to the amateur as well as professional ichthyologist. A slight consideration of some of these cannot but be of service to the angler-naturalist, inasmuch as that the necessity for personal observation will be made manifest. The careful observer of fish life is usually a better angler than the careless and unobservant fisher. This is certain.

Do fish sleep? An equivocal answer can only be given. My own impression is that they do; but when I say this let it not be supposed that I confuse their slumber, coma, or rest—call it what you like—with the sleep of animals. It is the same only in generic kind, inasmuch as that it relieves the functions as analogous slumber does in the higher animals. To understand the meaning I wish to convey it is necessary to bear in mind that the fish is eminently endowed with muscular and consequently great locomotive power. Moreover, as it consumes but little oxygen, the waste of tissue is not great, hence fish have been known to do without food for a great length of time. Similarly the stress on the vital powers is not great, compared with that produced by the difficulties of movement in land animals.

These facts—viz., great muscular power, easy locomotion, and small consumption of oxygen, being borne in mind, we can understand why the necessity for sleep is small, and are prepared to find that fish sleep but little. And what are the observed facts? I have, so has every angler, observed the pike lie in the sunshine oblivious of the gently lowered bait, and even unconcerned when gently touched. I have noticed that fish seem to retire towards the period of night before dawn, and Mr. Chas. Capel, of Foot's Cray Fishery, wrote to the *Field* some little time ago saying in effect that on his entering his fish house at night and striking a light he has seen the young trout rise from their recumbent position on the gravelly bottom of the trough and resume their accustomed vivacity.

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Fish presumably therefore do sleep—but lightly and seldom. Do fish hybernate? naturally follows the remarks on sleep, and again I cannot but assert that I believe some do, and that nearly all are capable of doing so. The well-known instance of the Ceylon mud fish, and fish of other waters in India, which bury themselves during the dry season and emerge on the rains filling the watercourses and hollows, is sufficient to show that at least one fresh-water fish indubitably hybernates. Again, the eel retires in winter to either the still deep and warm parts of the water, or buries itself in the mud in a lethargic condition, to be revived at the approach of spring. The tench also occasionally may be found buried almost completely, and I have, before now, taken him from the mud in a state resembling the lethargy of complete hybernation as exhibited by the dormouse or bat. Cold seems the chief agent in producing this state, and Franklin recites a case in which some perch were frozen completely hard, and were so brittle as to be easily broken, but were afterwards resuscitated on being gradually thawed. Instances of the same kind, but unfortunately not quite so well and definitely observed, have come within my own experience. In the example given by Franklin it is impossible to avoid the conclusion that remarkable vital powers under total suspension of animation were exhibited. The sum of evidence is that such power—by the bye, the existence of an analogous power in warm blooded animals is not proved to be impossible—is possessed generally by cold blooded creatures. The famous, and in some cases well authenticated stories of the "toad in the hole," or in the middle of trees, brick walls, &c., are forcible circumstances not to be forgotten. It should be added that the gills of such fish as seem fitted for hybernation, partial or entire, have opercula or gill covers with a membrane capable of being almost entirely drawn over the opening. The object of this seems to be the retention of moisture, and the preservation of the branchæ from impurity calculated to injure the texture.

The capacity for living out of water is very great in some specimens of fresh-water fishes. The carp is not infrequently in Germany and other continental countries kept suspended in nets, the only necessary condition being that a continual but not copious supply of fresh water be thrown over the body of the fish. Fish so treated are said to be fed on bread soaked in milk with occasionally a little brandy added. I have known perch to live twenty-two hours in a cool damp situation out of water, and I believe that eels, if carefully kept damp, would live longer.

The *diseases* of fish are many, and chiefly parasitic. Not only are the parasitic growth animal, but they are of vegetable growth also.

The *internal* parasites of fish are in number legion. A complete list would be a herculean task, as may be inferred from the statement of Dr.

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Cobbold (Synopsis of the Distomidæ) that of 344 species of "fluke" (or Trematoda) no less than 126 belonged to fishes. The same author also adds that this species of entozoa are "particularly plentiful in the stickleback, minnow, tench, perch, pope, trout, salmon, and still more abundant in pike, barbel, bream, eel, &c."

One of the most interesting of these peculiar creatures belonging to the above genus is the *Gyrodactylus elegans*, which I have more than once extracted from the gills of the bream. I read that Siebold and Creplin both found members of the same family attached to the fins, but I think it more properly is an internal parasite, and have so considered it. In this case an almost completely developed embryo could be perceived contained in the abdominal cavity.

Of the order of Nematoda, or round worms, I have repeatedly met members of the family *Anguillulidæ* in nearly all fresh-water fish. Of course, I am aware that some of the species, such as the "vinegar" eel, are non-parasitic, but others are not so, which is proved by my detection of them in the digestive system of the eel. It is an exceedingly minute worm, not often of a greater length than the tenth of an inch. Its tenacity of life is very remarkable. The observations of Needham, Bauer, and Dujardin have shown that the animal is capable of revivification even after a period of desiccation extending over five years.

The "thorn-headed" worms are particularly numerous in fish, especially in roach. I have found the large intestine of this fish completely studded with the *Echinoshynchus anthuris*, whilst a trout caught in June, 1877, exhibited a great many of a kindred species, the *Echinoshynchus proteus*. Its head is cone-shaped, studded with incredibly sharp thorns, set barb wise. I am inclined to attribute the wasting or atrophy to which the fish is subject to the presence of members of the *Echinoshynchidæ*.

I have thus briefly and scantily touched upon a few of the more minute and curious parasites which infest fish to my own knowledge. I now come to notice the large and important order of Cestoda, or "tapeworm," specimens of which I have more frequently than any other parasite taken from the intestines of our fresh-water fish. In order to obtain a correct idea of their nature as regards fish, it must be borne in mind that, as a general fact, the tapeworms found in fish are immature or larval cestodes, waiting to find themselves inside the heron, or plover, gull, diver, duck, or some such water bird before developing to maturity. Therefore, such worms usually display considerable difference in structure to those inhabiting mammals, "being commonly furnished," says Dr. Cobbold, "with special tentacular hooks, appendages employed as supplementary organs of boring and anchorage." There are variations from this, how-

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ever, as will be seen from the example I am about to cite. Some time since, whilst walking by the side of Virginia Water, I perceived a roach, apparently very faint—dying, but not dead. It measured seven inches. Its weakness was so extreme that I had no difficulty in capturing it. On opening it I found the intestinal canal very much distended with three tape worms, measuring respectively 5in., 6in., and 9in., by from ¼in. to ⅜in. broad. On examination no "hook appendages" or means of attachment of any kind could be seen, nor was any movement perceptible.

Dr. Cobbold kindly communicated its name to me as *Ligula digramma* of Creplin. The effect on the fish was most disastrous. The blood—and there was but very little—was nearly colourless, the fins pallid, the eye abnormally yellow, and a malignant pustule (similar to that which afflicts the carp) was to be detected appearing on various parts of the skin. I have before and since observed the same parasite—which completes its development in the heron usually—in trout, perch, and eels, and doubt not that it is very common in all still waters. The sexual development of the carp (*Cyprinus carpio*) remains arrested, whilst another species of this worm (*Ligula simplicissima*) resides in the abdominal cavity; and this fact may possibly account for the assertion of Gesner, that some carp which came under his notice were sexless.

An instance has been recently stated by Professor Sterling, of Edinburgh, in which 96ft. of tapeworm were taken from the pyloric gut of a salmon.

The *external* parasites are no less curious and worthy of attention, from the fact that their presence is often a valuable indication to the angler of the "condition" of his quarry, and from their frequent great microscopical beauty.

They may be divided into two classes, viz., vegetable and animal; and although the distinction is in some cases hardly perceptible, yet, as it undoubtedly does exist, cognizance must of course be taken of it. Apart from the fact, however, no special importance attaches to it at this time.

Of the vegetable organisms found parasitic on fish there is considerable variableness as to form and development, according to the seasons, a hard winter being sufficient to almost utterly destroy the more delicate species, and thus in some instances proving extremely beneficial to certain fishes—the barbel, for example, a fish peculiarly liable to parasites of all kinds. On the other hand, a mild winter and early spring are as favourable as severe cold is disastrous, to this form of vegetation.

There are great numbers of differing growths unclassified and practically unknown, but for advantages of examination and beauty of development, perhaps the little plant *Achlya prolifera*, usually to be found on the

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gills of the carp (old fish especially), cannot be surpassed as an example for description. To the naked eye this minute organism appears as a tiny bunch or tuft of colourless filament; and, although I have seen it in comparatively large quantities on the cilia of the gill, seems not to produce any marked effect on the "host" or fish. Under the microscope, however, it appears to be long tubes devoid of any partitions, extending in all directions. By the use of high powers a circulating juice or protoplasm may be seen occasionally flowing, to all appearances, in contradictory and opposite directions. After about thirty-six hours this juice or protoplasm seems to collect and dilate the end of the tube, and the granules, of which it was composed, after being isolated from the lower part of the tube in question by a rapidly-formed partition, gradually assume a larger form of sexagonal shape. Eventually, by a rupture of the parent cell, they are set free, and assume an oval appearance. They possess a pair of wheel-like motions, and, as if living, set about seeking new forms for attachment. If in a short time no appropriate "host" be found, the movement ceases. They exist a considerable time in water without deterioration if no suitable *nidas* be met with.

Although, as I have above indicated, no prejudicial result to the health of the fish seems to ensue on the growth of this parasite, yet a kindred growth on the gills of young trout annually proves fatal to an enormous per centage. It is well known among pisciculturists that a sort of epidemic which has been colloquially termed the "gill fever" is greatly to be dreaded, and always attacks the alevins of trout more or less immediately after hatching by the artificial process. The first symptoms are only to be perceived by the microscope. The gill cover must be lifted, and very minute granule-like tubes may be seen, occupying probably but a small space on the fronds of the gill, and interlacing each other closely. In a few days the growth increases, and either forces open the gill cover or completely penetrates it. I am inclined to class this curious growth with the myxogastric fungi of De Bary, on account of the similarity to some of these forms in the spread of the *mycelium* of the organism.

As to the origin of the disease I can offer no conjecture. Two opinions are held by scientists on the relation of fungi to disease; "some maintaining," says Dr. Carpenter, "that the presence of fungi is the essential condition of the disease, which originates in the introduction of the vegetable germs; others considering their presence to be secondary to some morbid alteration of the parts wherein the fungi appear, which alteration favours their development." In the case before us there is very little to choose between these opinions, from the difficulty of determining whether the origin of the outbreak is a vegetable germ, throwing off sporules, or,

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as in the latter theory, the result of a morbid condition in the fish, arising from the artificial incubation.

Certain, however, it is that the "gill fever" is at present as much without a remedy as the cattle plague, and the best chance the fish culturist has of saving the healthy fish is by isolation and cleanliness of the strictest kind.

Another remarkable form of vegetable parasite causing deterioration in the health of fishes has the faculty of boring through hard tissues, such as shells, scales of fish, as well as the hard tissues of animals. I have seen examples of this in the scales of the barbel and old carp. The boring resembles that of the teredo into the timbers of ships which have traversed the tropical seas—simple perforations, sometimes in various directions, but always so exceedingly minute as to give the idea of the existence of pores in the scale. Occasionally these perforations resemble nothing so nearly as the root of a Scotch fir, with its eccentric ramifications.

Members of the groups included under the term protozoa by Siebold, involving the line of demarcation between animal and vegetable life, are very plentiful on fish. It is obviously impossible, however, to go exhaustively into the subject of their histology.

Of the better defined animal parasites, huge numbers exist which appear to, in some sort, bear relation to the infusoria and rotifera families. But, to the exclusion of a consideration of these, I must pass on to a most remarkable little creature which usually attaches itself to a stickle-bat, minnow, or other small fish, and often causes considerable irritation. This is no other than the embryo of the *Anoden cygneus*, or fresh-water mussel. It has been estimated as a parasite proper, but really is not so; for a careful observation will reveal to the examiner the various changes of the larva, ending in its final attainment of the bivalve form. On the embryo being ejected from the valves of the parent, it may be found provided with a curious apparatus for "holding on." This consists in a number of barbed serrated hooks, situated like teeth between the valves, which the little animal snaps together continually until firmly embedded in the skin of its fishy "host." I have had minnows with the tail and gills covered with numbers of these creatures, resembling tiny onion seeds. A full description of this very interesting parasite will be found in the "Quarterly Journal of Microscopical Science," N.S., vol. 2, 1861, page 162.

The whole tribe of suctorial crustacea seem more or less to reside on fish. They imbibe the juices of the "host" by means of a peculiar proboscis, which in them takes the place of the jaws of other crustaceans, and thus to a certain extent saps the vital energy. Amongst these the very common "fish louse" (*Argalus foliaceus*) takes its place. This insect

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is well known to every angler as an inhabitant of perch and jack, especially the latter, during early season. Its body is covered by an oblong shield, which, however, does not extend over the posterior part of the abdomen. The mouth is armed with two styliform mandibles, and on each side of the proboscis is a sucking disc, furnished with prehensile hooks for attachment. There are four pairs of legs and a tail, which is a species of swimmeret. The insect has the power of swimming rapidly and in a straight line, but I have seen it turn rapidly over and over in a most erratic manner when swimming.

Belonging to the same tribe is the lernæa, which I have usually found attached to the gills or fins of tench or roach. And I learn from an American correspondent that it is the only parasite of the *Coregonus albus*, or white salmon of the Canadian lakes and weirs. This animal has a "long suctional proboscis; a short thorax, to which is attached a single pair of legs, which meet at their extremities, where they bear a sucker, which helps to give attachment to the parasite; a large abdomen; and a pair of pendant egg sacs." The males are particularly unlike the females. "No one," says Dr. Carpenter, "would suppose the two to belong to the same family, much less to the same species, but for the microscopic study of their development." Some of the vegetable parasitic diseases of fish are quite as prejudicial to the health of fish as the internal, witness the salmon disease, which latter has been identified as the *saprolegnia ferax*.

Having thus reverted to the diseases of fresh-water fish, I may notice the manner of its natural death in passing. First, the movement grows less rapid and energetic, and the fish seems occasionally to lose consciousness, it grows weaker, now rolling with involuntary motion on its side, or lurching head first. Finally it seems to be standing on its head, and gradually topples over, floating belly upwards. It lives a little time, till at last the gill covers cease to move, and the fish is dead. Not very much pathos in this, but sufficiently suggestive, however, of a similiar going the way of all fish, flesh, and fowl.

Of necessity much in this chapter is left unsaid that ought to have been said. The idea is, however, to be suggestive rather than comprehensive.

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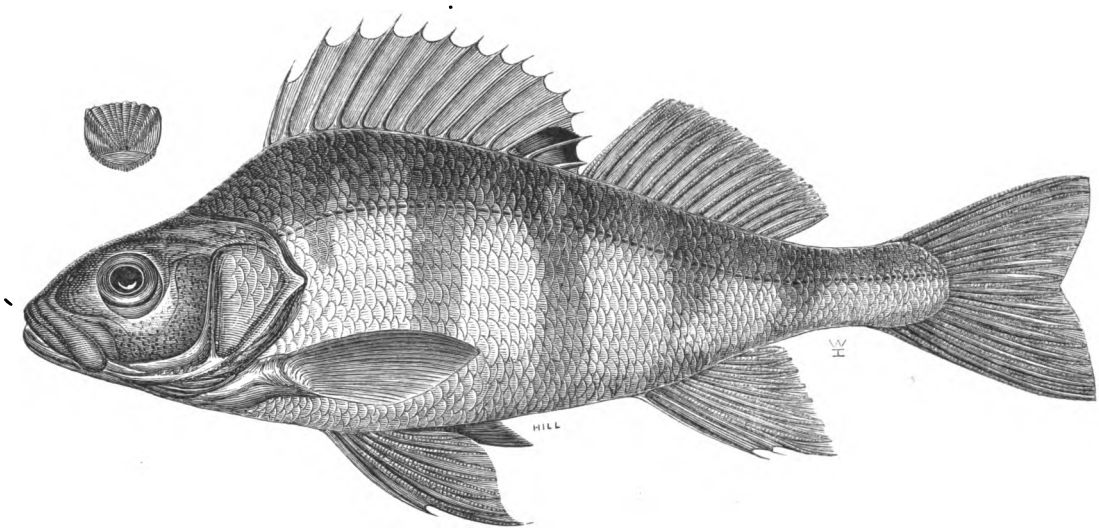

THE PERCH—(*Perca fluviatilis*).

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CHAPTER IV.

THE PERCH.

THE perch (*Perca fluviatilis*) has been placed by both Cuvier and Yarrell at the head of the first genus, *perca*, as shown in the ichthyological chart given in a former chapter, and I therefore commence with it in this part of the work devoted to a consideration of the various fishes of our waters. I am aware that Mr. Pennell, contrary to the general practice of writers on fish and fishing, has also begun in the same way, but I apprehend that no charge of imitation or plagiarism can be brought against me because of that fact. The classification of fishes before given, for which Mr. Pennell is not responsible, places the perch family first, and I therefore thus proceed to consider its members, taking each of the other fishes in their order of succession.

Ichthyologically the perch may be thus described: Gill rays seven; two back fins distinct, separated; rays of the first all spinous, those of the second flexible; length of head as compared to body as 2 to 7; teeth small, uniform in size, curved backwards, situated on both jaws, vomer and bones of palate; fore gill cover notched below, serrated on posterior; edge gill covers bony, ending in a flattened point; scales rough, hard, and not easily detached. Colours (when in good condition): Upper part of body greenish brown, fading into a yellow white below; is marked with dark transverse bands; first back fin brown and spotted, second back fin and pectoral fins pale brown; ventral, anal, and tail fins bright vermilion. Useful as this description is, it, however, does not convey an image of the fish to the reader's mind like the following, taken from an old writer: "The pearch is a fish that is hook-backt sometimes like a hog, and armed with stiff gristles, and his sides with dry thick scales." The hues of the perch vary very much from those given, but in clear water, and, as stated, when in good condition, it is sufficiently well described above.

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Of the *percidæ* family only two are known in British fresh water; one is the subject of the present chapter, and the other, the ruffe or pope (*Acernia vulgaris*). The *percidæ* are, however, distributed over nearly the whole of Europe, as well as the British Isles. The Rhine and the Danube stand pre-eminent amongst Continental rivers for this fish, and Lapland produces it plentifully. The salt water, Dr. Badham notes, contains more interesting specimens of the same family, and some of them in their voracity are even terrible—the sea wolf, for instance; others are terrible only in name—for example, the "sky gazer" of the Mediterranean, who rejoices in the scientific cognomination *Uranoscoods hemerocœtus*. The Nile also is possessed of a variety of perch which on account of its recalcitrant appearance and fierceness of disposition the alligator even refuses to do honour to by swallowing. The courage of all the *percidæ* is acknowledged. The old writer before referred to (whose name I do not know and cannot find out) asserts that our perch has more bravery than the pike, and Mr. Pennell justifies this in an example where a perch vanquished and killed a pike of its own weight with no special difficulty. His valour is also shown when he fights for a dearer stake—his life. Says another author: "The perch is a handsome, noble-looking fish, a bold, dashing biter, and a courageous fellow when hooked, never yielding as long as he has any strength remaining, but fighting bravely to the last. . . . In short, he is altogether, when large, one of the best fish for sport which the fresh water contains." The size to which the perch attains is variously stated. In England the limit is probably 6lb. I confess I never saw one over 4lb., but Blakey speaks of some of 6lb., taken from Whittlesea Mere, and "Ephemera" says one was caught in the Serpentine which weighed 9lb. One, which is said to have measured 2ft. in length, is mentioned by Izaak Walton as having been caught by a friend. Shäffer says that in the church of Lulea, Lapland, the head of one is preserved which is nearly a foot long, which, according to the ordinary proportions of perch, would belong to fish of 3ft., if not more. Perhaps this relic, however, has been, like the vertebra of the famous Manheim pike, somewhat enlarged by artificial means. Deformed perch are not unknown. Sir John Richardson gives an interesting account of a specimen with distorted tail and very hunch-back, found at Fahlun, in Sweden, and I am informed that perch with congenital deformity are constantly taken from some lakes in Merionethshire. I have myself taken a perch which presented a very singular appearance about the dorsal extremity, having a complete inversion of the tail, with an eccentric twist added. My opinion at the time was that the injury probably originated in the egg, as I have noticed is occasionally the case with trout and salmon.

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The idea has gained ground that perch are self concipient. I frankly state that I don't believe it. I have repeatedly met with rugged rough old veterans (males) whose anatomy has completely settled the question, and if the expression "old" may be applied without reprehension to females, I may say the same in reference to them. In September and October, when the swarming begins, it is uncommon to find a male fish amongst the "common herd." These exclusive gentlemen inhabit the deeps at this period, and solemnly enjoy themselves in the more congenial society of barbel, large chub, trout, bream, &c. The possibility is that Ovid is responsible for the idea when he speaks of the "channe" or "gaper," a species of Greek perch, thus :

Ex se
Concipiens Channe gemino fraudata parente.

Mr. Manley, in "Notes on Fish and Fishing," states his belief in this anatomically absurd idea. Anyhow, perch manage to multiply with tolerable numerical success. Picot, of Geneva, has estimated as many as 992,000 eggs in the ovary of a female fish of but 1lb. weight. The female winds the spawn, which is usually deposited in ribands, in and out the weeds, &c., near the shore; this is impregnated by the male, and in the Thames nine-tenths of these eggs are eaten by the swans and other enemies. Otherwise the multiplication of perch would be enormous. The spawning season is variable, sometimes being in April, and occasionally as late as the end of June.

The food is very various, but being a fish of prey, its appetite is invariably carnivorous. Occasionally one is caught with paste, but such occurrences are justly regarded more as mistakes on the part of the fish than the result of instinct. Nothing in the way of live insects, from the crustaceans of the water to the ephemera of the air, comes amiss. The fresh-water shrimp is as acceptable as the larva of the Mayfly, and I have even seen a perch take a Mayfly in its pseudimago state. The chief of its aliment, however, is derived from the small fry of fishes, and its appetite is so unscrupulous and insatiable that I have even taken a perch with one of its own species and family, and found the tails of several minnows sticking out of its gullet undigested, in fact, hardly swallowed. Raw butcher's meat comes not amiss, and a prawn is often caviare.

The *habitat* of *Perca fluviatilis* is more varied than any other fish of prey. During spring and summer it is to be found chiefly in shallow parts, near weeds, feasting on the parasitic riches of the water vegetation, or seeking some lively minnow or small gudgeon; in autumn it takes the quieter and deeper parts of the river or lake; as winter approaches it

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retires even more completely, or assembles in huge shoals, if the weather be frosty, near some quiet nook or patch of decaying vegetation. This information, although strictly true, is capable of great qualification. The angler will find the general habitat thus given vary as does the wind or the weather. Even, however, as one expects cold winds and weather during the winter solstice, and soft southern breezes and sunshine in summer, so may he expect to verify my guarded statements as to the habitat of the perch. Careful observation, however, will teach him more in one day than I could ever do in writing.

The *diseases* of perch are not many, and are chiefly parasitic. As his Acanthopterygian lordship devours all kinds of insects, and not unfrequently reposes (especially in still water) after a meal in a situation contiguous probably to insect-fostering weeds, this statement is not surprising. A sort of "fluke" buries itself in his gill, and a tapeworm is found in his inside; the embryo of the mussel (*Cynea anodens*) clings to its fins; and the fish-louse (*Argalus foliaceus*) resides with seeming pleasure on the well-fed fish. How *far* any or all of these indicate bad health or cause it I cannot here pretend to say, and I know of no authority on the matter to which I can refer the reader; presumably, however, these parasites do influence the health of perch. Perch seem chiefly to die of that worst of all piscine ailments, too much "hook." I think it is an otherwise long-lived fish. A peculiarity of the fish when hooked is that it can almost invert the maw, ejecting all its contents. This has been made much of by a recent writer; but it is easily explainable. The maw is very large in proportion and elastic, and hence easily protruded and returned.

The perch, unlike most other fishes, is not very rich in folk lore. I say folk lore because it conveys the idea intended of tattle of etymology and legends, superstitions, and old-fashioned misconceptions. Dr. Badham, in his "Fish Tattle," has collected a vast number of these items, but as the work is doubtless beyond the class of readers to which I chiefly appeal, I transcribe some of them for these pages. These kinds of jottings are often very interesting and not unfrequently of considerable volume. The carp, for example, furnishes a quantity of such "tattle;" so does the eel; but the perch, well known and esteemed, being such a frank natured fish, has to a certain extent escaped the "wonderous tales and legends old," in reference to its corporeal and mental qualities, which seem to attend some of its *confrères*. Praise for its beauty and condemnation for its unsuspecting boldness in biting seem the chief qualities in the mention of it by old writers. Ausonius refers thus to it:

> Nor let the muse in her award of fame,
> Illustrious perch, unnoticed pass thy claim,
> Prince of the prickly cohort.

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Drayton, in the "Polyolbion," speaks of it as a natural enemy of the pike:

The perch with pricking fins against the pike prepared.

Pope lauds his beauty in exaggerated terms:

The bright-eyed perch with fins of Tyrian dye.

As a matter of fact, its fins are not of Tyrian purple hue. However, the passage will pass muster much better than that referring to him in the "Complimentary Ode to Izaak Walton," which runs:

The greedy perch, bold, biting fool.

Walton, sharing Drayton's opinion, says, "to affright the pike and save himself the perch will set up his fins much like a turkey cock will sometimes set up his tail." I am inclined to believe that there is little method in this setting up of fins, beyond that contained in a pride of personal appearance which seems inherent in most gaudily furnished animals.

The origin of the word "perch" is not very difficult to trace. Mr. Manley, an author delighting in etymological difficulties, and one of infinite resource in getting out of them, in "Notes on Fish and Fishing" traces it back to the Greek *perke*, the feminine of the adjective *perkos*, signifying some dark colour. Hence the fish was termed "perch" or "pearch" from its darkly banded sides. He quarrels with the naming of the perch, however, and considers that the old Anglican name *Bears*, *i.e.*, *bars*, was much better. In the "Haven of Health" the author says that the perch is so called "by a figure of antiphrasis—*Quia nulli piscium parcet*—because he does not spare any kind of fish." Mr. Manley very logically connects the word with our vulgar use of the similar phrase, *perk*, *perky*, meaning a person of piquant, conceited, assuming, pugnacious nature, apt to be spinous and prickly if annoyed.

Of course the perch possessed in the eyes of old naturalists and physicians certain gastronomic and medicinal virtues. In Germany there is a proverb which runs "More wholesome than a perch of the Rhine." Gesner prefers it to a trout, and he informs us that the physicians value it so much that they recommend it to be eaten freely by wounded men, women in childbed, and those suffering from dangerous fevers. Aldrovandus also praises it; and old doctors, with characteristic whimsicality, were used to prescribe two (imaginary ?) round bones from the perch's head as a remedy for "stone." The wholesomeness is, of course, undisputed, and I am really inclined to give an unqualified preference to perch over all other fresh-water non-migratory fish as an adjunct of the table. I know of no more respectable product of fresh water than a well-fed Thames perch of from half a pound to a pound and a half in weight. There is only one way, however, so far as I know,

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to obtain the full "flavourality" of the fish, and that is given by Mr. Francis Francis himself, an inveterate ichthyophagist, in his book on fish culture—*First catch your fish*, and then kill it. Wipe it with a damp towel, and then, *as it is*, with inside intact, and head, gills, and scales remaining, broil it over a clear fire quickly. It will come to table seething and smoking. Insert a knife behind the head, and the scales, like a suit of armour, will come off; a little butter, pepper, and salt complete the preparation, and the flesh may be flaked from the bones, firm, white, and of most delicious flavour. By this method the fish is cooked in its juice, which considerably benefits its flavour.

The tackle used in perch fishing is neither of a costly nor elaborate kind. It may be thus enumerated and described. The paternoster consists of a yard length of gut of somewhat stout consistence, on which at intervals are attached two or three medium sized hooks whipped on a short piece of gut or gimp. They should be separated by quite 12in., that in the event of two fish being hooked at the same time they may not get entangled. I ordinarily fit up a paternoster with only two hooks; on one I put a worm, and on the other—usually whipped to fine gimp, in case of an adventurous pike—a small gudgeon, dace, or minnow. At the extremity of the said line or paternoster a bullet or oval plummet is connected. I prefer the oval shape, as it works better amongst weeds. This plummet should by no means be bright, but painted a weed green colour. The reason for this is to be found in the event so often met with of a perch becoming covetous of the metallic weight, and disappointing the angler by relinquishing its hold as he draws the avaricious fish to the surface. The paternoster can of course be used either with or without a float. I personally prefer the latter method. The float, in my opinion, is only a necessary nuisance at the best, and whenever possible it should be dispensed with. The process of working the paternoster depends for its perfection and consequent results on experience of the stream or lake, but generally it may be said the angler should learn to be deliberate and precise in searching every nook and cranny with the suspended lead, neither be precipitate nor too slow in his movements, and, above all, avoid unnecessary noise and changes of personal position. The rod should be taken in the right hand, and a few yards of slack line in the left, coiling it as required, or releasing it as the baits are urged 3yds. or 4yds. or more from the boat or bank. Always, as in trolling and spinning, begin at the nearest likely spot, and work outwards in an increasing radius. The rod should be not above 10ft. or 12ft. at most, and be tolerably strong and stiff. Immediately a fish is felt it is necessary to allow time whilst eight or nine can be counted. As the perch makes no fuss about gorging the bait, and invariably takes it

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head foremost, a longer time of grace is not required to be given. Strike smartly when the period named has elapsed, and play your quarry leisurely. I say *leisurely* advisedly, for it not unfrequently happens that as one fish is being killed, another, following with curious eyes the eccentric struggles of his *confrère*, perceives the other baited hook, and forthwith grows voracious. Having hooked two fish, I would say get them in the boat or on land as soon as possible, that is, as soon as your tackle will allow.

The paternoster being the most efficacious of tackle for perch, I presume most of my readers will adopt it. Spinning and trolling with a minnow are also occasionally very killing, but not so much so in the aggregate, in my experience, as paternostering. A small bronzed and silvered spoon, or single hook gorge bait, are the best tackles of these respective alternatives from paternostering. In the latter case the hook should be somewhat larger than ordinarily used for these fish, the lead light, and the bait a minnow or small gudgeon. It is necessary to give about twenty seconds before striking.

The baits and tackle may, notwithstanding the precision of the foregoing, be very much diversified. Worms of nearly all kinds, gammari, minnows, raw meat, &c., for example, are variously advocated. But in selecting methods and baits only one process can be attended with success, and that is the most natural. It may certainly be difficult at times to follow this eclectic method, but the careful student of the water will understand my meaning and acknowledge the truth of the assertion. At one time, for example, it may be found inexpedient to fish with the worm, for the reason that the lure is not in its best condition; at another time the minnow is unacceptable to the perch, because it is flaccid with spawn; at another the fault is in the fish itself, necessitating the finest tackle and greatest caution and finesse. The angler, therefore, in the selection of baits, as I have said, decides on those likely to suit natural percine exigencies, and of course the selection of bait decides the selection of tackle.

Generally, however, very fine tackle need not be brought into requisition. Early in the season a cockspur worm or the tail of a lob-worm will often lure your quarry on to destruction to your satisfaction. A minnow is also admissible, but even more valuable than worms is the little freshwater shrimp. A good all-year-round bait is this, as well as specially good for early season. It is necessary to use a roach hook, however, when fishing with it, and to strike immediately. The live shrimp is, as well, a capital lure in brackish water, and an imitation shrimp is said to be irresistible when the perch frequent the shallows during the heat of summer. It should be thrown like a fly.

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As the season advances small gudgeon are specially their fancy, and the paternoster may be brought into use. For spinning with a flight a minnow is good, a small barbel better, and a stone loach best—if the latter be prepared by being dropped into warm oil, which toughens and turns the little fish to a golden colour. Kill it, of course, before this process is resorted to.

During flood time a lob worm may be used in still water on the ordinary running or ledger tackle, and sometimes with great success. The largest fish I ever took was with the tail of a dew worm, from still water; it scaled over 3lb., and the bite was almost imperceptible. A favourite method with me is to rig up a live bait as for trout, *i.e.*, about a yard of gut and one single hook, and to drop down from bough to bough in the punt, allowing the gudgeon or loach to swim beneath the overgrowth of ait—many a fine perch have I taken in this way, and many a goodly chub. Considerable nicety is required, however, to prevent the fine line from getting entangled. Several ways of ground-baiting for perch have been suggested, and I will describe two of the most effectual. The first is to procure from the butcher a quantity of bones from which the meat has not been entirely scraped. These should be fresh. Tie to a line at intervals, and sink them where you suspect the presence of perch. Fish over them with a piece of fresh raw beef or a minnow or worm. Perch, being almost entirely carnivorous, are very fond of flesh, and may be taken in this way when all other methods have failed. The other is, obtain a globe of transparent glass, and, after filling with water, turn in a crowd of minnows, and secure them with muslin over the top. Then lower to where you expect the perch may be, and fish after a day or two round it. This is more applicable to still water, and in one signal instance I saw great results accrue from it. Speaking, however, in view of all circumstances, I cannot but think that the better plan is to find your perch by moving yourself about till his habitat is hit upon. It is a pity to take advantage of perch when he is such a bold biter. Why should the angler seek to emulate certain noble sportsmen in forming a battue of fish? Let us stalk our deer in this case, and not by strategy draw them together in a multitude only to be slaughtered. The best times of the day for perch, and especially large fish, are in summer the first thing in the morning, while the dew hangs over the water, and just before dusk, and in winter during early afternoon.

Before concluding this chapter I may be permitted to give some directions for the capture and preservation of minnows, for although other baits are killing, minnows are unquestionably *the* bait for perch when perch are in the best condition. For capture, procure a large wide

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mouthed transparent pickle bottle, and have the bottom cut out. Then tie over the open bottom a piece of thin canvas or calico. Place, then, some small worms or bread in the bottle, then drop the whole apparatus in the stream where there are plenty of minnows, with its mouth looking down stream, having a cord, of course, attached to its mouth. The result of this arrangement, if properly made, is that the water percolates through the canvas or calico slowly, and eddying currents are formed in the bottle, which retain the worms or bread in a state of perpetual agitation. This attracts the minnows, which, in great numbers sometimes, enter the trap; and when a sufficient number is there—haul up. Of course a casting net obviates this trouble, but so few persons can throw one that I give what may occasionally prove a very useful "dodge." To preserve the minnows when you have them, I should recommend keeping them in a cool place in hard pump water. It is surprising how tough they get, and hardy. Of course this does not increase their longevity to any great extent, so I do not affirm they will keep any lengthened period. In winter, however, they will remain healthy two and three weeks under such conditions. And now a final "wrinkle." When carrying the minnows to the scene of operation do not use a bait can but a few soda water bottles—in this wise Fill half full of water, put about a dozen minnows in each, and cork tightly. The shaking in travelling will sufficiently aërate the water; and the minnow, under any other circumstances sickly and ill-conditioned, will arrive healthy and lively if even you have to travel fifty miles.

Having thus in a practical and, I trust, concise manner said all I deem necessary to the tyro, with a hint perchance to the experienced angler, perhaps I may be allowed to become gossipy in reference to my own achievements with *Perca fluviatilis*. I have an idea—possibly wrong, perhaps right—that my readers like a yarn of doughty deeds amongst the finny tribe, especially when such a yarn happens to have foundation in fact. In Mr. Manley's book on "Fish and Fishing" I perceive he notices a splendid catch of perch at Virginia Water, which I communicated to him. With the reader's permission I will narrate the particulars of that day of days. Time, November, 1876. Place—for the information of those who do not know it—an expansive lake, its edges fringed with alders clothed in the russet hues of late autumn. The silver birches, long since denuded of their leaves, here and there gleaming palely beyond; the great beeches, yet farther off, on either side also, still retaining their rich brown leaves, crisp and rustling, not yet near falling. Yet, beyond all, on the summits of the inclosing eminences of the lake still and high pines clothed in their solemn and plenteous plumes of dark foliage. The cooing from the doves in the otherwise

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silent pines salutes us as we put off in the little fishing punt. There is a soft ripple on the water from the north-west—too gentle to be cold. The coots rise and fall in the distance on the tiny waves, and their white bills shine in the clear sunshine, and their querulous voices come ever and anon to us as we gently row to the selected spot. So much for the surroundings.

There are three of us—good anglers and true, and our paternosters are of the finest and strongest, our minnows are of the most lusty and vigorous from the Colne, and the ruby cockspur worms are well scoured and tough in the *sphagnum* moss, where they have luxuriated for three days. The spot selected is on the south-east side of the water, and we know its sub-aqueous aspect is truly percine—of fish, fishy. Judge for yourself, experienced reader! In summer, the water crowsfoot, and white, thick-stemmed, rough-rooted lily, form a mass of luxuriant blossom and verdure of some sixty feet of surface by thirty across. At *this* time its superficial exuberance is no more. The first frost that touched the trees had placed its withering finger on this island of plants, and now only here and there a stray leaf appears to indicate the whilom plenitude of verdant growth. In fact, the stems, half rotten, remain only, and amongst them, lingering after the late feast on animalculæ, furnished by the growing plants, we expect to find our "pearches" ravenous after their protracted abstinence, and, like a flock of sheep, ready to follow their leader.

We duly arrived at this much-to-be-desired trysting place, and, dropping the weight overboard quietly, and fixing a short rypeck to the stern of the punt, we essayed to commence operations. The paternoster box was opened and the Nottingham rod appointed with its delicate but strong eight plait line and its free running reel. What had we forgotten? for each one, ere attempting to adjust the baits, paused as if something were wanting. Ah, Eureka! Taking from the capacious tackle basket a curious flask, your obedient servant poured out a nepenthe liquid, *Spiritus Hordei Scotici*—Anglicè, Scotch whisky, supposed to be peculiarly efficacious when perch fishing—and the cup passed round with the customary appropriate invocation to the water god, so nearly forgotten. Had such a ceremonial been omitted I should probably not have had a chance of chronicling the splendid ensuing results.

However, we duly drank to good luck, and I baited my hooks and gently lowered them overboard just outside the submerged weeds. My friends did likewise, and we waited. No answer during the first five minutes, as we kept our lines gradually moving, now here and now there. Presently a run on my line, and, after a short interval, a nice 4lb. pike lay panting and exhibiting his mottled sides to his exulting captor.

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Nepenthe repeated; line rearranged and hooks rebaited; waiting were we, as erstwhile.

A quarter of an hour now slowly passed away, and the fragrant nerve-composer, in the shape of the Virginian weed, began to tell its gentle tale upon our slightly excited feelings. "Ah!" sighed one, "I'm afraid we're not in luck to-day—pass the lights, old man; thanks! What a splendid kingfisher, did you see it? By Jove! I've got him!" (This last in a tone of exultation.) And so he had, as fine a perch (a two-pounder) as ever gladdened the heart of an angler. "Whew!" I also jerked *out*, as I jerked the hook *into* the nose of another something which seemed mightily heavy. "My goodness!" shrieked our other friend, as he struck smartly into what seemed a log of wood. Three fish at a time on three lines from one boat are not a joke, however much fun can be got out of the affair when the said fish are fairly obedient to the dictates of the rod and sturdy line; but in the case I am endeavouring to describe the fun did not seem very apparent, for each struggler sought to trespass on each other's water, hence confusion of rods, lines, fish, and imprecations—and right vigorous imprecations were some of them. However, we managed to get somewhat straight at last, and, providentially, did not lose either of our three captures. Three, did I say? Nay, four, for during the combat another "pearch," envious of the glorious rollicking gambols of his impaled brothers, met a similar pleasant fate on one of my spare hooks, and so dear, but possibly incredulous reader, we did land four fish—perch—within five minutes of each other on three lines. They were a splendid sight—not one could have been less than 1½lb. The day's results tabulated were fifteen fish, weighing 21lb.; and if any reader desires it I shall have pleasure in giving him the names of the gentlemen who participated in the magnificent sport that day afforded.

Above and beyond the curious incident of taking four fish with three lines at one time, there was another which caused considerable merriment. I struck a fish and was playing him, when he took it in his head to run across my neighbour's line. My friend immediately, thinking it a bite, struck, and, lo! we both played one fish, for on landing it the two hooks were found in the fish, one on each side of the jaw, not *inside* at all. My fish must have ejected the bait just before I struck, but I had him, nevertheless; whether he essayed to take my friend's bait or not, and met with the same treatment, I cannot pretend to say. The fish "went off the feed" at about four o'clock p.m., through my missing my fourth fish, otherwise we might possibly have bagged more.

How fragrant is the memory of such a red letter day! No scoffer can rob me of the pleasaunce of its recalling.

Yet another episode in my piscine experiences. This time the destina-

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tion of myself and friend was Chertsey. It was a beautiful late summer morning, which even at murky Waterloo gave promise of a splendid day. About an hour's ride landed us at Chertsey station safely, and we decided to walk to the water, where our fisherman was waiting. Now I had arranged to try the boughs below the weir, and for that purpose I intended giving the so-called fresh water shrimp a fair trial. A good lot of the tiny bait had been collected by our fisherman, and were stored in a moderately sized bait-can duly supplied with water. They were assorted, and of more than ordinary size, and as I had never previously tried this bait I laid particular stress on this day's results.

We put off from the shore, and it truly was a delightful scene. The Woburn Hill, on the east of the bridge, rose grandly, clothed in its luxuriant garb of deciduous trees and verdant undergrowths. The river flowed steadily under the old grey bridge, and to the west the weir in the distance made sweet music. The old lock house, so familiar to me, faced us. Near, as we put from shore, and fringing the bank, were the low growing alders and willows. Here and there a gnarled trunk stayed the stream and formed a pretty eddy, truly perchy. The water outside deepened and held the bronze barbel and other fish of equal sporting value, including our coveted quarry. This, at least, I knew, and emerging from these depths I anticipated the advent of many a goodly fish. Nor was I disappointed, as the sequel will show.

We shot across the stream and crept up the opposite side, so as not to disturb the water intended to be fished, passing up the back water to near the weir. I fitted up my tackle, which consisted of a fine gut line, to which was attached an ordinary No. 10 roach hook, on which I placed a small shot about 1ft. from the hook. My friend had an addition of a small quill float, his perception of a bite being not so acute as my own. We presently reached the highest point and nearest to the weir, from which we intended proceeding down stream. The *modus* of the fishing consisted of being slowly handed down, and so carefully fishing near the bank under the overhanging willows. Our fisherman knew his business perfectly well, and regulated the pace to a nicety. My first fish was a chub of some ¾lb., but my friend took a nice little ¼lb. perch at almost the same time. It fought grandly for so small a fish, and I could not help wishing it had been four times the size. The light Nottingham rod would have required careful handling. My wish was gratified to a certain extent, not, however, with a perch, but another chub which came up, and with a smack of its great white lips licked in my tiny bait. He scaled 3¼lb., and was a veritable beauty. How he did fight to be sure; but the triumph of skill over brute force and sagacity was eventually complete, and he succumbed as is usual when *I* fish. (*Query* conceit?)

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We had got but some ten or twelve yards down by this time, when, as I was drawing in my bait, I felt tug, tug, and struck, but to no effect. I drew up, and there followed the bait a grand perch of the old school; he must have been 1½lb., and his splendid sides and elevated fins actually gleamed in the summer glow. "Ah! ah!" said he, "not for Joe, or perch rather; I'm not to be taken in so precipitate a manner; besides, who's that fellow with the stick and how about the boat?" He came up with an important sort of snort, and went down again like a log. I pitched the bait gracefully over where he disappeared, and again he coquetted with the poor struggling little gammarus impaled on the hook. If the perch did not actually speak the words attributed to him, *he looked them*, and so he looked language, when for the third time he nibbled at the point—this time of my hook. I struck, and fixed the keen steel. One might have almost heard the imprecations his lordship transmitted in electrical vibrations to my hand. However, as usual, he found a more confined if not so comfortable a lodging in the well of the punt. The sport after this somewhat slackened, and no other fish was found for some time to play a like part. My friend, however, presently got a nice perch with a cockspur worm. Immediately after this came the grandest fun of the whole day. A likely looking spot being reached, I, as usual, dropped the light bait and web-like line a little ahead of it, and allowed the bait to sink. Directly came a terrific pull, and I was fast into a fish of no ordinary dimensions, who ploughed out into the stream and up. "Let him go," shouted our fisherman, and I did so. Forty yards of the fine Nottingham line must have gone out, and I was beginning to tire of this sort of thing, when the fish doubled and shot back again with inconceivable rapidity. I struck a smart blow on the ratchet of my Well's spring reel, and soon had up some of slack line. But the fish, where was it? Simply and only at home. I caught sight of a web of line rising between twigs and a branch or two. Sure enough, the fish had resumed his former position. Almost miraculously, however, I managed to disengage the line, and pitching in a small shower of split shot, I started the fish once more. This time he leaped out of the water, and presented the beautiful sides of a veritable Thames trout. Language fails to describe the tussle which ensued, but he was eventually landed comfortably at 6½lb. This was not a perch, but it nevertheless was the keystone of some splendid perch capture. We got fourteen of these fish after, and the day's total results, I remember, plumped the scales down at 23lb.

Before conclusion, and while on the subject, I may here be allowed to jot down a few good takes as a sort of additional lure, if the description given be not sufficient, to the embryo angler. Mr. Francis talks of getting 60lb. of perch in one day from the Kennet, many weighing 2lb.

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I once took 37lb. in three hours, some close on 2lb., from above Shepperton Lock. A relative of mine reports a take of 53lb. in half a day (two rods) at Chertsey. These are scanty samples and of little practical value in enumeration, but I give them with a smack of maliciousness, knowing how they must make the mouth of the inexperienced tyro to water and his soul to long for such famous ultimata of skill and good luck.

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CHAPTER V.

THE RUFFE OR POPE.

THE Ruffe or Rough (*Acerina vulgaris*) is another member of the perch family found chiefly in rivers. It is not unlike the perch in outline, and on the other hand its colours very much resemble those of the gudgeon. At first sight one is almost inclined to suspect hybridity, but although there are certain important resemblances, a close inspection does not satisfactorily bear out the suspicion. The similarities to both the suppositious parents at first sight consist in the appearance of a cross between the characteristic spinous back fin of the perch and the soft back fin of the gudgeon, the colour approximating to that of the gudgeon, and the fact that the ruffe selects the same haunts and spawns at the same season as the perch. The distinct structural differences, however, on closer examination, are sufficiently clear. In the ruffe the back spinous fin is connected with the other fin nearer the tail, which in the perch is not the case. In the perch these dorsal fins are completely separate. The next difference lies in the fact that the kind of scale is also distinct, and a comparison between the following generic points of the ruffe given by Mr. Pennell with those of the perch given in the last article will further show the distinctiveness of each fish: Gill rays, 7; one back fin, but with an indentation at the junction of the spiney and flexible rays, the fore part being spinous and the hinder part flexible; teeth very small, numerous, and uniform, situated on jaws and front of vomer; no scales on the head; fore gill cover notched, gill cover ending in a point; colouring of upper part of body and head generally light olive brown, merging into a yellowish brown on sides, growing silvery white towards the belly; back, back fin, and tail spotted with brown; pectoral, ventral, and anal fins, pale brown. Its weight rarely exceeds 2oz., although I once

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did catch a ruffe out of Domesday Deeps, near Shepperton, which weighed 5oz. This is a very exceptional weight, however.

The ruffe is capable, like the stickleback and miller's thumb, of exhibiting what seems very like affection for its fellows. I recollect trying to keep one of these fish alive in a tolerably roomy aquarium, but although it had the society of several minnows, gudgeon, and perch, each successive fish died for no apparent cause till seven were numbered with the dead. At this time I recollected having read that ruffe thrived better in company with their own species, and having obtained two, I placed them in the aquarium, and there they are now, and come regularly to be fed from my fingers on blood worms.

The *habitat* of this fish is usually running streams, but it is a mistake, which Mr. Pennell in his "Angler Naturalist" falls into, to suppose that they can live and thrive only in rivers and brooks. I have taken them from at least one large lake, and of a somewhat larger size than the Thames fish. The Isis, and indeed most English rivers, produce the fish. It is also an inhabitant of northern rivers, but is said to be unknown in the south of Europe.

The food of this fish is similar to that of the perch. All sorts of animalculæ and worms are voraciously consumed, and in the process this fish seems to take a large quantity of earth. It is very bold in pursuit of a minnow also, and, although not so impetuous perhaps as the perch, yet, size for size, and considering his superior powers of strategy, it perhaps devours quite as many fry. Speaking of strategy reminds me of an incident which proves conclusively the sagacity capable of being exhibited by this little fish. I had placed in my aquarium a large number of tiny crayfish for the purpose of watching the interesting movements of the little crustaceans. Mr. Ruffe, sen. (the larger of the two there established), also seemed highly curious as to the new arrivals, and soon began to reconnoitre. He became at last so apparently satisfied that they were good to eat that without further ado he approached a miniature lobster of about half an inch in length, and seized and attempted to swallow it. The lively little crayfish, however, did not agree with that sort of thing, for it immediately darted backward, as is the wont of the creatures, with a powerful sweep of its broad little tail. Mr. Ruffe was evidently nonplussed—indeed not a little frightened it seemed to me. He, however, after some consideration and conference with his partner, returned again to the charge, selected a much smaller crayfish, lying recumbent and unconcerned near a small stone. Mr. Ruffe approached cautiously, but this time *behind* his prey, and thus suddenly by securing the powerful tail he managed to swallow the kicking crayfish like one would, if obliged, prefer to swallow a fork—handle first.

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Ruffe will take paste, for I have caught them with it; but they are chiefly fish of prey.

The diseases of these fish are similar to those which afflict perch. First, too much *hook*; second, parasitic growths, both vegetable and animal. The spawning season seems to clothe it in a coat of horribly offensive and thick slime, which clears to a normal quantity as condition is regained. At the interesting period referred to the female is very often covered with parasites, the chief in numbers and agility of which seems to be the ordinary fish louse, *Argulus foliaceus*.

The folk lore or history of this fish, like that of the perch, is conspicuous by its absence, and I only refer to the subject to say that Cuvier attributes the first observations of it to Dr. Caius, a contemporary of Gesner. Caius sent a drawing of the "Aspredo," as he called it, which he had found in the river Yare, near Norwich, to Gesner, who included it in the famous *De piscibus et Cetis*. Walton appears to have been familiar with it.

Gastronomically it is a much esteemed fish. Walton says that "no fish that swims has a pleasanter taste." I much prefer the ruffe, so far as its flavour is concerned, to even the delicate sweet gudgeon or its cousin, the perch. It, however, requires careful cooking, not that it is a fish to which it is necessary to add all sorts of condiments, but because to over-fry it or over-bake it (with bay and rosemary) is to spoil a certain nutty flavour which a ruffe from the clear river at the latter end of July possesses. However, it is a small and rare fish and not worth while quarrelling with the cook about. It is best when fried in the way the wives of Thames fishermen know how to fry gudgeon; and if so dressed the *gourmet* has a treat indeed.

The tackle required for ruffe fishing should be somewhat stronger than mere gudgeon tackle, but not much. I usually, on finding a shoal of these pleasant little fish, rig up a paternoster of five or six No. 10 hooks on a fine gut cast, with one swan shot as a sinker, and baiting each hook I trust to sight and feeling to hook my fish. There is considerable fun in this style, and besides the sport there is no little education of the hand and eye obtained, results of which come in very handily when fly-fishing—for grayling, for example. As indicated before, these fish go in shoals, and, if careful, the angler may in the majority of cases get the whole swarm.

The baits are chiefly red worms or cockspurs, but, successful as they are, I know a better, which is no other than the larvæ of the Mayfly. This insect looks something like a lizard of a greenish hue, and may be obtained in early season from underneath stones in a gravelly rapid stream. It may be simply impaled. Another very good bait is my little

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useful friend *pulex gammarius*, but it is not so killing as either of the two preceding. Part of a small mussel is often of use, and may be tried when other means have failed to complete the capture of the whole shoal. The worm is, however, after all a safe and sure bait, and has the merit of being easily procurable. Walton advises a ground bait of earth, but this advice originated possibly in his having seen the eagerness with which a whole shoal *en masse* will seek any slight turbidity of the water. It must be borne in mind that they seek minute entomastraca and annelids, not dirt, like a lobworm, although, sooth to say, they manage to swallow a lot of dirt sometimes, judging by what I have occasionally emptied from the pylorus. A good raking of the water with the ordinary gudgeon rake is all that is required, and then the angler may work his will. Walton recommends angling for him to the young angler for practice, because he bites vigorously and often.

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CHAPTER VI.

THE MILLER'S THUMB, OR BULLHEAD.

THE Miller's Thumb or Bullhead (*Cottus gobio*) is one of the only two representatives of the family of fishes with "hard cheeks" in British waters. The interesting little stickleback, to which I shall refer in the succeeding chapter, is the other. The Miller's Thumb is somewhat like the gurnard, and although its scientific name signifies "a large headed gudgeon," I fail to perceive the slightest similarity between it and the gudgeon. The broad head, the disposition of the fins, and their spines, and its voraciousness, all and severally indicate its connection with the *percidæ* family. The principal structural distinction consists in the suborbital bone being more or less extended over the cheek, and connected with the gill cover. Its scientific position is thus indicated: *Series* 1, bony fishes; *order* 1, ancanthopterygii (fishes with spined fins); *family*, "with hard cheeks"; *genus*, Cottus (from *Kotte*, the head—Greek). It is colloquially termed in some parts of England, "Tommy Logge." *Cottus gobio* has teeth in both jaws (although Walton says not), spines on the gill covers, gills with six rays, two back fins, and no scales. It spawns from about April to June, and produces a large number of ova. It makes its nest in not so elaborate a manner as the stickleback, but yet with a sort of method. Boring with its flat-spined head by the side of a large stone it gradually excavates an opening. The spot is selected for advantages of stream. Having accomplished its purpose, the female deposits the eggs, and is quickly followed by the male in the act of impregnation. This effected, the male covers up the ova and keeps guard until the young fish not only are born but arrive at an age to look after themselves. Like the female stickleback the maternal parent is of a very pronounced cannibalistic turn of mind, and it is often, notwithstanding careful guard, impossible for the fry to escape the hungry

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affection of their mother. It requires careful and unremitting attention to observe the process of spawning and incubation, but by keeping oneself concealed it can be done as in the case of the stickleback. The curious appearance of the female when full-roed has been noticed by Walton. Mr. Pennell likens the appearance of the fish to that of a cow's udder, and the comparison is not inapt. The fresh water bullhead never exceeds 7in. in length.

Its habitat is chiefly running streams (rarely stagnant waters) in England, Scotland, and countries from Italy to Sweden. Mr. Pennell says it is rare in Ireland. When at home it lives almost entirely under stones during the day time, only now and then coming out to bask in the sun or snap up some larva too tempting to ignore.

The food of this fish usually is curiously similar to that of the perch and ruffe. It chiefly feeds on the "larvæ of water insects, the ova of other fish, and minute fry." I can furnish an addendum which greatly enlarges one's views of the voracity of this little fish. The larvæ of water insects and the other baits given it certainly does devour, but fancy the following catalogue of food being compiled from the results of the stomach of one "Tommy Logge" of 5in. (1) A small *Cottus gobio* of 2in.; (2) a minnow of ½in.; (3) a flint pebble weighing 27grs.; (4) a caddis shell (or rather remains of one); (5) remains of *Pulex gammarus* or freshwater shrimp; (6) remains of one larva of May fly; (7) shell of trout egg; (8) scraps of things, probably remains of entomastraca and other crustacea, in all weighing 164grs. Lest some critic should disagree with this list on account of the shell of trout egg being coeval with the caddis, I may mention that the date of dissection was April 26, 1876. The conclusion from the examination of *this* fish's stomach is that its appetite was at least as various as that of the perch. Even more so, I imagine. I never yet heard of a perch swallowing a stone, although trout have been frequently reported to have done so.

The diseases of the "Miller's Thumb" are hardly worth mentioning. I never saw but one *Cottus gobio* dead from disease. That had a malignant pustule on the back, and the red termination to its fins, similar to that found on eels, dead from the so-called "scarlet fever," to which they are liable. Its internal organisation did not reveal specific derangement. Heart and stomach, pyorlus and all, were atrophied and of a pale colour. The gills were pale. The cause probably was some local irritation, causing it to rub, as barbel do, against its rocky domicile, and hence the sore which killed it. The irritation may, possibly, in the first place, have been originated by some parasitic fungus, to which inconvenience I observe this fish and the

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roach are peculiarly liable. Generally, however, this does not prove fatal.

The names by which this fish is known are worthy of attention. The term "Miller's Thumb" unquestionably is given it from some fancied or real resemblance to a peculiarity of the miller's thumb. Yarrell, whether rightly or wrongly, thus speaks of it: "It is well known that all the science and tact of a miller are directed so to regulate the machinery of his mill that the meal produced shall be of the most valuable description that the operation of grinding will permit when performed under the most advantageous circumstances. His profit or his loss, even his fortune or his ruin, depend upon the exact adjustment of all the various parts of the machinery in operation. The miller's ear is constantly directed to the note made by the running-stone during its rotation over the bed-stone, the exact parallelism of their two surfaces, indicated by a particular sound, being a matter of the first consequence; and his hand is as constantly placed under the meal-spout, to ascertain by actual contact the character and qualities of the meal produced. The thumb, by a peculiar movement, spreads the sample over the fingers; the thumb, in fact, employed with tact, is the gauge of the value of the produce; and hence have arisen the sayings of 'Worth a miller's thumb,' and 'An honest miller hath a golden thumb' (Ray's Proverbs), in reference to the amount of profit that is the reward of his skill. By incessant use in this way, the miller's thumb acquires a form which is said to resemble exactly the shape of the head of the fish so constantly found in the mill-stream, and called the Miller's Thumb." An allusion to the name occurs in Beaumont and Fletcher's comedy of "Wit at several Weapons" and in Merrett's "Pinax." I have heard the expression "Miller's Thumb" used in Gloucestershire in reference to a congenital malformation of the thumb, by which the nail rather resembles a Spanish chestnut than a filbert, and I can entertain but little doubt but that Yarrell's solution of the cognomen is correct. The *alias* bullhead requires little explanation. One is familiar with the action of a bull when charging an opponent—not from actual experience, I hope, however—and the ostrich-like burrowing and charging of the bullhead must resemble those of our own *taurus*. Mr. Manley, with Badham-like predilection for etymological humour, gives a string of words—with a prefix illustrative of the word before us: "Bull trout, bull beggar, bullbriar, bullier, bulldog, bullfice, bullfinch, bullfrog," and adds, "Is this prefix our 'bull' (the bovine creature, ornament and terror of our meadows) which is said to come from the Anglo-Saxon *bellan* to war (by the way, the red deer in North Devon are said to *bell*), or is it 'bull,'

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Latin *bulla*, 'a globe,' in the sense of a large mass? Then, again, we the have Irish 'bull,' a bulletin, bullet, bully, a Pope's bull, and a bulrush and bulwark, with only one 'l.' Here is a fine field; but I leave it, only adding the remark that Dr. Johnson interprets a bull head as a 'stupid fellow,' a 'lubber.'" Thus Mr. Manley; and, after what we have quoted and said, I think we may turn to the other cognominations of the little fish. "Tommy Logge," and in France "tête d'âne," or "donkey's head." Tommy Logge is suggestive chiefly by sound. "Tom," in English vernacular, signifies assertiveness of a characteristic order. A "tom-cat" is a masculine appellation, and indicates individuality. So "tommy" is a miniature "tom," and "log," whether with the additional "ge," or not, is associated with obstinacy (like a log)—hence loggerhead, as an opprobrious name for the chub, which fish is broad headed, and prone to bore downwards when hooked. The plain English of the term "Tommy Logge," therefore, is a self-assertive and big-headed creature, and this description perfectly fits *Cottus gobio*—the big headed gudgeon, albeit not a gudgeon at all.

In Russia the fish is used, like the kingfisher in Oxfordshire, as a sort of weathercock. It is asserted of the kingfisher that if after death it be suspended by a single thread it will infallibly point to the part of the compass whence the wind blows, and travellers affirm a like belief amongst the Russian peasants in reference to the "Miller's Thumb."

Gastronomically it is a delicacy. I have eaten it dressed as a gudgeon, and can bear testimony to the toothsomeness of the little fellow. It is asserted that it is eaten in Italy with relish, and Mathiolus, a physician of the sixteenth century, commends it highly for its "taste and nourishment." Wilson, the naturalist (and Dr. Badham endorses the statement) says that its flesh becomes red like the *salmonidæ* in boiling. I do not believe it. I have tried boiling the fish, and never yet did see the slightest approach of the flesh to a pink or red hue. It remains white like the gudgeon, so far as my experience goes.

Its capture is the simplest in the world if you have not the patience to angle for it. Two persons go together, and one lifts up each stone, and the other instantly hooks the fish up with the fingers. The sudden *transitus* from darkness to light dazzles it, and until it feels the fingers it does not attempt to get away. If, however, one chooses to angle for it, the best way is to *bob* as for eels, with fine but strong tackle. The tackle is as follows: No. 6 hook, attached to stiff gut, the top of a rod, to which is attached about 5in. of wire; the bait is a red or small lob worm; impale it on the hook, and place

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all on the end of the wire. Introduce the bait under stones, &c., taking care to keep hold of the end of the line connected with the gut. Let the fish have the bait and hook for some time before striking, then strike and draw out the fish. This is the only mode of *angling* for bullheads with which I am acquainted.

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CHAPTER VII.

THE STICKLEBACK.

THERE are six species of sticklebacks in English waters. These are, *Gasterosteus trachurus*, or the rough tailed stickleback; *G. semi-armatus*, or half armed; *G. leiurus*, or smooth tailed; *G. brachy-centrus*, (with short prickles or spine), or short spined; *G. spinulosus*, or spiny, having four spines on the back; and *G. pungitius*, or the prickly stickleback, having ten spines on the back. All these species have various characteristics in common. They are generally scaleless, and are all plated or mailed on the sides. They also all have spines. The usual size is from 1in. to 5in.—rarely, however, the latter. The fish in appearance is a brilliant little fellow, and has a remarkable power when engaged in the internecine contests taking place so frequently between sticklebacks, of changing his tints and aspect, chameleon-like. At one time the fish blushes over with an almost phosphorescent glow, and at another it pales to a sheeny silver, shot with green. This notable peculiarity is chiefly shown during the spawning season, and leads me to make a few remarks upon another exceedingly interesting characteristic of the little fish.

It is an accepted fact that fish of nearly all kinds are morally true to their physical distinction of cold-bloodedness, so far as affection is concerned. In English waters there are, so far as I know, only two exceptions. One, as before noted, is the bullhead, and the other is the fish under consideration. Indeed, this latter displays an affection for its young and a ferocity in protecting its nest, ova, or fry truly wonderful to observe. Mr. Pennell has aptly said that "if the pike is the tyrant of the water, the stickleback is certainly its knight errant." I shall doubtless be pardoned if I enlarge on this curious trait somewhat.

If the reader will come with me in imagination, I will lead him on a fine May morning to a tiny stream, where the water crowsfoot and water

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plantain grow and forget-me-nots fringe the banks. The runlet is clear and moderately rapid, the soil at the bottom is alternate shingles and white sand, with here and there a dark patch of mud, and here and there a huge stone, around which the water circles, forming tiny eddies and miniature whirlpools. Near to one of these we will quietly seat ourselves on the soft bank and peer into the water carefully. The planorbis water snail is slowly peregrinating the leaf of a large alisma or water plantain, and near the stem of the latter is poised a fine Stickleback, with gorgeous silver green sides and lustrous eyes, all accoutred with spines and spikes, expectantly gazing at a group of smaller ones a little lower down, whom he evidently has but recently put to flight. Slowly they again seem bent on disturbing him in his dignified repose and swim shyly up stream approaching his lordship. As they near him, with a sudden dash he is amongst them, and they are scattered far and wide, one little mite being ripped open by the powerful spines. The victor returns again with satisfaction to his former station ; and now watch his further proceedings. First he swims leisurely around the stem of plantain as if debating what course to pursue. Probably he is preparing a mental estimate, or, being his own architect, is constructing a plan, for he is about to build as elaborate a nest as ever the Long-pod constructed amid the close foliage of the box tree. After a while he begins operation by tugging water weeds, conferva, and various other suitable *débris* to the selected site, and this accomplished, he solidifies the foundations by strewing a few good mouthfuls of sand upon them. Nature has not left him unprovided with cement, and in proof of this, the next step is to glue the materials together, which is accomplished by the little creature drawing its body over the structure and depositing a mucus, which seems to harden in the water. This is not the only means taken for the stability of the edifice. After the cement has been applied the fish may be seen driving, by means of its powerful fins, currents of water against it, which is evidently for the purpose of finding if a weak place exists. Should a grain of sand or piece of weed become displaced, it is immediately restored to its position and firmly cemented. Sometimes, to try the strength of the structure still more vigorously, the fish hurls itself against it, and this not once only, but repeatedly.

To avoid misapprehension, I may state that the building processes detailed above occupy usually some days. I have compressed the period in describing them for the convenience of the reader.

The foundations once sure and complete, the next operation is to collect materials and build the walls of the nest. The object of the fish is to build a barrel-shaped structure, as smooth as possible inside. For this purpose the process of selection and rejection sometimes goes on for

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days, and at other times four or five hours. Not, therefore, to keep the reader at one ideal stickleback stream too long, I may briefly say that the materials are chiefly pieces of straw, roots, leaves, all placed, in the case of the smooth-tailed stickleback (*G. leiurus*), in a longitudinal position. The process of cementing after the structure is raised is a long and laborious one, and is not finished until the whole edifice is perfectly sound and stable from an aquatic point of view. Two apertures are constructed in the nest, one for ingress and the other for egress. They are quite smooth and symmetrical, and offer no opposition to the passage of the fish.

The reader may now observe, in our imagined stream, the use of the superstructure so ingeniously raised by *Mr.* Stickleback. Keeping a watchful eye over his building, lest some brigand-like stickleback should seek to rob him of the results of his architectural labours, he seeks a buxom partner from amongst many females hovering near, and seemingly approving his hitherto arduous exertions. The lady usually is comparatively unattractive in appearance (which is as much an anomaly as the excessive parental solicitude exhibited by the male), but very obedient, and, after a little conference in an unknown and inaudible language to the observer, she dutifully accepts the escort of the gallant cavalier, and enters the nest at his apparent bidding. Here she remains some little time almost entirely concealed, and the operation of depositing the ova is accomplished with little difficulty or delay. Meanwhile, like a paladin of old, Sir Stickleback Gasterosteus keeps watch, and ever and anon charges through the aqueous plains at other opposing, or seemingly pugnacious sticklebacks more vulnerable than himself. Sometimes an inadvertent female, seeking to propitiate his prickly lordship, advances near the guarded domicile, perhaps unconscious of its containing a rival, or may be impatiently jealous of her long stay. She is hurled back, however, not very kindly, but often with dangerous violence; indeed, I have seen a persistent lady stickleback ripped open by the stiletto-like spines and sink to the bottom of the tank and die. Woe, also, to a male intruder who is courageous enough to venture upon a combat. The green and gold armour absolutely gleams in the sunlight, and the inconceivably rapid onslaughts of the defender, instinct as he is with conjugal and parental bravery, soon make an end to the fight. The intruder either makes a virtue of necessity and retreats or dies, or by a rare chance possibly conquers the legitimate owner of the nest. In that event he takes possession, and, shame on the fickleness of the female mind, the hitherto beloved partner of a faithful fish who has sacrified his life for her sake, like another Queen of Denmark, accepts a new lord without a show of resistance.

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After the depositing of the ova by the female is accomplished she retreats and receives the seeming caresses of her mate, and then retires to a distance, whilst he enters the nest and completes the rest of the business. This does not take long, and after arranging any part that may have been displaced by the female, he again appears and seeks another partner, wooing her as gently as the first, and with as much solicitude guarding her as she fulfils her part of the conjugal relation. And so it goes on until some six or seven layers of impregnated ova are spread, and the cavity of the nest is filled, with the exception of a small space, which Mr. Stickleback reserves as a peep-hole, through which he may watch, with those marvellously brilliant eyes of his, the daily progress of incubation in the intervals of his sentinelship. For a whole month this sentinelship is unflagging, and he has no little trouble in keeping inquisitive females from poking their noses into the structure, they being naturally also very anxious to look at the eggs, and, most unnaturally, anxious sometimes to devour them too.

We will now suppose the month expired and the tiny *gasterostei* broken from their close prison-house in which they have been "cabined, cribbed, confined" so long. Immediately they appear Mr. Stickleback's anxieties increase. They are "little Turks" in every sense, for they are almost of microscopical size, and as termagant as could be imagined, giving their papa a world of trouble. He knows, but they don't seem to, that their maternal parents and several unrelated gentlemen friends are constantly in the vicinity seeking what tiny *gasterostei* they may devour. Sometimes one strays from the flock, like the inquisitive little trout of the fable, but his course is instantly arrested, and he is seized by the not over gentle jaws of his guardian, and borne back to the company of his sisters and brothers, having sometimes a good shaking given him in the bargain. And so the family cares of our stickleback increase until these fry arrive at a sufficiently mature age to shift for themselves. When this period, according to the judgment of their adult parent, is arrived at, he disbands them, and they go about their business feeding ravenously.

Such is a short account of the domestic habits of these little creatures, but I need hardly say that no written description can or does do justice to their wonderful eccentricities and curious characteristics. The process described may be observed by anyone in the spring and summer of the year. Truly we may apply to them the well-worn words of Virgil in reference to the bees: "Et magnos animos in parvo corpore versant!" (they have big souls in their little bodies).

The food of the stickleback is of almost as various a description as that of the perch. It chiefly, however, feeds on the fry of other fish—and not infrequently its own—and fish eggs. It will eat great quantities of perch

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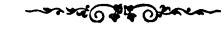
spawn, considering its size, and is even ambitious enough to demolish trout ova. I have been amused to see the fury of a tiny stickleback on finding itself too small to compass a trout egg, and the egg too tough to admit of tearing with its pigmy fangs. The stickleback is liable to a curious death through its voracity. I have seen it entangled amongst the complications of frog spawn, which it has sought to devour, by its spines catching the glutinous mass containing the egg. Its persistence after food is so great that it will, as every schoolboy knows, suffer itself to be drawn out without the assistance of a hook. Sticklebacks are very plentiful in Lincolnshire, but exceedingly scarce in the Thames—peculiarly so, I may say.

I am going to surprise some of my readers by saying that the capture of this little fish may be made an exquisitely funny operation, and therefore amusing. At the risk of being sneered at, I am obliged to confess that the recollection of my juvenile exploits amongst the gasteroste, and my late "tiddlebrat" fishing in maturer years haunt me with still a pleasant flavour. Everybody, of course, knows how schoolboys catch these fish, but the following episode will show a more refined method, which on the occasion to which I refer was to me very original and interesting. I was staying at Prestbury, a sweet little village in Gloucestershire, situated just at the foot of the Cotswold (Cleeve) Hills. Through the village runs a small stream which, so far as I am aware, contains nothing but sticklebacks. One morning I was strolling by its narrowest part, and beheld a little urchin, perched on a large stone, fishing. The said urchin, with an instinct of sport which will make him a great angler, if I am not mistaken, had constructed a rod out of a piece of thin steel wire which was very pliant, and had actually made a line out of long human hair. At the end of it was a tiny pin, bent, and on it a worm. The dexterity of the angler so much amused me, as he with due regard for the fragility of his apparatus, played each furious little fish, that I, after a time, asked the little fellow to let me catch one. He handed the rod to me, and I was surprised at the pretty sport this insignificant fish and childish toy-like tackle afforded. I have never since despised small things because they are small, as people are wont to do, and I am not ashamed to confess that, since the incident of which I speak, I have passed some pleasant hours in catching minnows and sticklebacks, and watching their graceful and interesting movements. By the by, the stickleback chiefly uses its pectoral fins, and not its tail, in propulsion.



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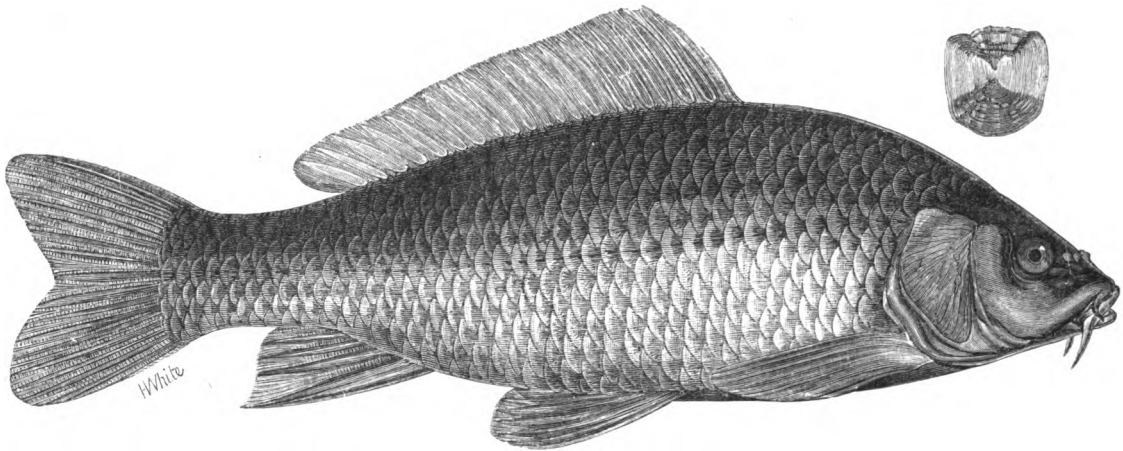

THE ENGLISH CARP—(*Cyprinus carpio*).

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CHAPTER VIII.

THE CARP.

THE spined (or acanthopterygian) order of fishes contained by British water being finished with the stickleback, we now, following Cuvier's classification, come to the malacopterygian, or soft-finned fishes. The carp is properly a *M. abdominale*, or a fish with soft belly fins, and its chief characteristics are large scales, soft lips, weak jaws, powerful palatal teeth; indeed, these qualities attend all the Cyprinidæ family, of which the common carp (*Cyprinus carpio*) is chief. There also are three other species of carp, namely the gold (*C. auratus*), the gibel (*C. gibelio*), and the crucian (*C. carasius*).

Its general appearance from a clear lake and when in good condition is bronze golden in colour and brilliant eyed. It is not a swift, but a strong agile fish, fitted rather for lakes and soft running streams than for the swift waters in which trout and such fish live and thrive.

The gullet of the fish (as in nearly all the Cyprinidæ family) possesses large teeth, with which the fish ruminates. These are saw-like, and work upon each other with considerable force.

The barbs of the *Cyprinus carpio* distinguish it from its other relations—*C. gibelio* and *C. auratus* having none—and because these feelers, or barbs, as in the case of gudgeon, cod, and barbel, perform, to a great extent, the office of perception, the palate and tongue seem to be far from sensitive. The brain of the carp is particularly large, indeed, larger in proportion than any other fresh-water fish, and seems to be a measure of its mental capacity. Professor Owen estimates the size of fishes' brains generally at an average of 1 in 3000, but that of this fish is as 1 in 500; and, according to Blumenbach, exactly the same in proportion as that of the elephant. Small wonder, therefore, that Buffon, bearing in mind its craft and subtlety, terms it the "river fox."

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Its organs of hearing, like those of the tench, are complex and good; but E. T. Higgins, Esq., informed Couch that these organs are not uniformly alike on each side of the head.

Some carp produce both milt and roe, and are, consequently, hermaphrodite; others produce no spawn at all, or are unfecund. The latter phenomenon is probably owing to a disease engendered by parasites. The larval cestode (*Lignea digramma*) seems to have the effect of arresting the primal formation of roe, and in some cases which have come under my notice the immature spawn has been ossified and inclosed in a membraneous bag—a state of things obviously caused in each case by the enormous tapeworm I have discovered in the fish. Aristotle says the carp produces spawn five or six times a year, according to the stars—a statement upon which no reliance can be placed; although I am convinced that in some warm situations, and under favourable circumstances in regard to food, they sometimes produce spawn twice during the season. This is very exceptional, however. Carp usually spawn about May, and are in good condition again very shortly after. The number of eggs sometimes produced by a female fish is prodigious. A carp of 9lb. has been found on examination to contain no less than 621,000 eggs. Often, in fact, the roe, on being taken out and weighed against the fish, has outbalanced the latter. The gambols of the carp during the act of generation are very amusing to witness. It is not at all a rare thing to see a carp leap 5ft. and 6ft. over an obstacle in a manner similar to the salmon. The male fish is apt to milt with the roe of other fish; hence a hybrid found in Holland between carp and bream, and a frequent hybrid in Prussia between carp and roach.

Like the eel, the carp is, in its natural undisturbed condition, torpid during the colder weather of winter. Indeed, the power it possesses of sustaining extremely cold temperature with out loss of vitality is marvellous. Sir John Franklin (first voyage) says that if when frozen the insides were struck out by a hatchet on thawing, even then animation returned. John Hunter, as a set-off on this, asserts that a temperature of anything below 30 deg. is fatal. From an examination of the original details of these two examples, I am of opinion that in the case cited by Sir John Franklin the cold was intense and sudden, and by reason of the blood of the fish to a great extent rushing back upon the vital parts, these were saved from complete solidification. In the latter case the cold was prolonged and gradually brought on by chemical means. This difference in the *modus operandi* would probably influence John Hunter's dictum on the subject. I have myself resuscitated perch after thirty-six hours' freezing (by placing them in a pail of

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ice cold water), when they have been so brittle that a smart concussion would have broken them in many pieces like glass. Professor Owen explains this remarkable physiological fact in regard to the carp in a somewhat abstruse manner by saying that its "endurance results from the formation of the vagal lobes of the *Medulla oblongata*." It therefore can live on the minutest supply of oxygen. This also explains how it has lived in the peculiar situation in which it is sometimes found—under roots of trees and in deep solid mud; situations so strange, Willoughby remarks, as to warrant the assumption that the fish has resulted from spontaneous generation. This explanation of the endurance of carp will not, however, answer for the peculiar fact that they have been, and probably still are, fatted out of water. Buffon says that at Anhalt Dessan they are fed on bread steeped in brandy, and the Hon. Roger North says that considerable revenues are derived from this kind of fish culture in Bradenburg, Saxony, Mecklenburg, Bohemia, and Holstein. Rheinold Forster, in "Philosophical Transactions," art. 37, speaks of the same fact in Polish Prussia.

In the general culture of this fish the Germans are considerably before the English. The usual way is to drain the pond every seven years when practicable, and, after taking the fish, the bottom is sown with rye grass, an enormous crop of which is often produced by the rich black mud; the cleaning of the pond in such cases after the grass is cut is an easy matter. After this common hay seeds are thrown down and allowed to grow to a good turf growth. The water is then let in, and the pond re-stocked with young Carp. The young grass is especially beneficial to the store fish, and, if all other conditions are favourable, the speed of growth is of very great celerity. This, at least, is the method pursued at Holstein.

There is also a method of castrating carp, which was first detailed in England by a Mr. Tull to Sir Hans Sloane, who afterwards showed the process to George IV. Sir Hans gave a full description of the operation in a communication to Mr. Geoffrey, of the Royal Academy of Science of Paris, from which it appears that eight "carrushens" (a kind of carp from Hamburgh) were operated on. The ovary leads out of the part termed the cloaca, and the experiment consists in severing it from the ligamentary muscles and the membrane, and afterwards sewing the wound up with a silk thread. The fish is then returned to the water, and is said to be after a time more voracious, and of a decidedly superior flavour when brought to table.

The age of the carp is a very moot point, and the possibility of its living to pass the tenth decade is maintained by some writers, especially German. Gesner instances one which reached over one hundred years.

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Buffon quotes an authority who asserts he had seen one of over 200lb. weight, and 5ft. in length; such a fish must have been very aged.

Rheinold Forster says he was shown some carp in a pond at Charlottenberg of 2ft. and 3ft. long, and he was told they were between fifty and sixty years old. I do not think this is exaggerated. Mr. Pennell, in one of his publications, refers to carp in a lake in Windsor Park, which, although only about a pound or two in weight, nevertheless, according to the testimony of the then fishermen, were thirty years old. Like barbel, these fish seem impervious to the influence of time, and age only seems to add to their unwieldy bulk and to deteriorate their quality in a gastronomic sense. It is said that the big old carp to be found in the fosse of the Chateau at Fontainbleau, in France, were placed there in the time of Francis I. Buffon speaks of some in the fosse of Portchatrain which were one hundred and fifty years old. There is no method of precisely determining the age of these fish. An approximation may be arrived at, however, by a microscopic examination of the scales and counting the concentric rings.

The carp is a fish very susceptible of electrical impressions. Of this I have repeatedly convinced myself by insulating a convenient receptacle containing carp, and passing a charge of electricity through the water. Although previously still, and apparently asleep, the immediate excitement caused by the shock it is impossible to describe, whilst the process of filling a glass globe, containing these fish, with electricity, as one would a Leyden jar, has produced in the fish a state of uncontrollable agitation painful to witness. There is no doubt that earth currents influence other fish—especially trout—in an analogous manner; and from water being a superior conductor of the electric fluid to air, I infer that the effect of atmospheric changes on fish are, in proportion, more marked than the same on the human being. We all know how much the weather has to do with the general balance of our own healths.

The Gibel carp is distinct from *Cyprinus carpio* in many important respects. For the principal of these I quote Mr. Pennell: "The whole general appearance of the fish is much more thick and chub-like than the common carp, resembling, in fact, the rudd in external form more than any other fish—the common carp much more nearly approaching that of the barbel. In the common carp the length of the head is almost invariably greater than the depth of the body in the deepest part, while in the Prussian carp it is always much less. The scales of the Prussian carp are larger, the number in the lateral line being about thirty-three, and in the common carp about thirty-eight. The mark, however, by which the angler may always at once distinguish

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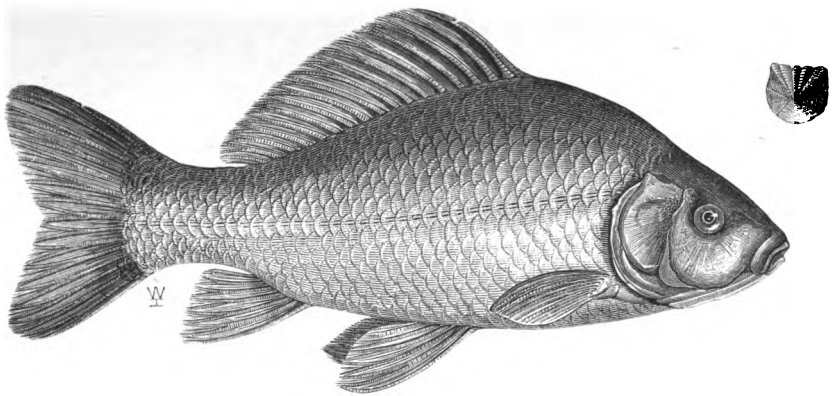

THE PRUSSIAN, OR GIBEL CARP—(*Cyprinus gibelio*).

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mark, however, by which the angler may always at once distinguish the two fish on the most cursory examination is the mouth. This in the common carp has two little barbels or beards at each corner, whilst in the mouth of the Prussian carp no beards whatever exist."

Of course there are other differences which will strike the angler-naturalist; but these are the principal, and amply suffice for distinguishing the fish from its *confrères*.

The *Cyprinus auratus*, or gold fish, is another kind of carp, but whether an actually distinct species or not I am doubtful, for this reason: I have on two occasions found the *Cyprinus carpio* with bars of distinct golden colour on their bronze sides. I am, therefore, inclined to think that the *auratus* is a sport of nature which has been carefully bred and cultured until little or no tendency is exhibited to "throw back" to the original parent characteristics. Of course, this idea admits of discussion, and I do not therefore, insist on it. The *auratus* is a native of China, and was introduced to this country in 1681. In 1728 the then Lord Mayor of London, Sir M. Decker, possessed a goodly number. The Chinese feed them on white paste, and "also," says Buffon, "give them lean pork dried in the sun and reduced to powder." Snails and their slime appear to be caviare to them. Buffon also asserts they will eat the *lemna* or duckweed, and also small fry It would appear that the Chinese make quite an industry of these little creatures, collecting the spawn on hurdles and protecting it until hatched by the warmth of the sun. Couch mentions that they exist in quantities in China in the receptacles used for condensing the steam into water near the factories. A temperature of 80deg. is by no means unusual in these places. At the Westminster and Brighton Aquariums are to be seen some curious sports of nature, termed "telescope fish," with eyes projecting and movable, also possessing four distinct tails merged in one base. They are very curious and interesting varia-tions of the common gold fish.

The food of all carp is of a very diverse nature—almost all vegetables, when young and tender, from blades of grass to green peas and white-heart cherries, all grain from maize to rye. Pastes are recommended, flavoured with cheese, sugar, honey, gin, and turpentine; flies, slugs, gentles, grubs, caterpillars, worms, are in the catalogue; even small gudgeon are not to be despised as bait, and I have known a large carp bite a decent-sized eel in half, swallowing the tail end.

The *habitat* of the carp is chiefly lakes in temperate countries all over the globe. They are also found in rivers, but seem to thrive best in the quiet of sheltered lakes. India and China, Austria and Prussia, Russia and Eastern Siberia alike produce species of this fish. Valen-

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'ciennes states that it thrives and reaches an extraordinary size in the Caspian. During summer these fish love basking in the sun, and especially in early morning before the dew is off the water they may be seen gambolling together when the water is still. In Virginia Water are some mighty old fellows, 18lb. or 19lb. apiece, and I have seen them before now rolling like pigs, before sunrise, as I have said. They also, about this time, delight in shallow water, but as winter approaches they seek the warmer depths. They are essentially social fish, and love the company of their fellows.

Their diseases are chiefly parasitic, owing probably to the lethargic habits of the fish. These diseases are usually most disastrous about spawning time, when old ones especially die from various causes. Flukes in the liver, like with a sheep, obstructions by chickweed and the anacheris weed, and tapeworm are the chief internal diseases, whilst a fungoid growth develops itself in mild seasons—"leprous" says Blakey—which turns the fish almost white. I have seen a carp of 16lb dead from this, and a tapeworm in the pyloric cœcum of some 15yds. The fish may now be seen at a little inn, the Jolly Sandboy, New Egham, Surrey, and was taken from Windsor Park.

The carp has a most respectable ancestral history, and indeed a very ancient one, seeing that it is recorded that the father of Kungfoo, or Confucius, received as a present a brace of carp on the birth of his illustrious son, some 500 years before the Christian era. The Indian Rhohita, which is almost identical with our *Cyprinus carpio*, can trace a lineage more ancient still, for do we not find it was the form of a carp which Vishnu assumed during his second *avater* for the purpose of recovering the Vedas, or sacred books, that had been purloined by a demon during the general consternation caused by a deluge? And, seeing this, need we be surprised to find that a fish of so much semi-sacred importance, and having so high and honourable a place in the Hindoo mythology, should be selected as an emblem of a peculiar Eastern honour, termed in the Persian Court language, *Maha Maratib*—the order or Dignity of the Fish? Mr. Pinkerton says in reference to this, "those admitted to the order receive the high-sounding titles of 'Victorious in War, Saviour of the State, and Hero of the Land,' and are distinguished by a representation of this carp formed of gilt metal and partly enveloped in a mantle of green embroidered cloth—the sacred colour of the prophet—being carried on a pole before them by an officer seated on an elephant." The Hindoo emblem indicative of the connection of the Rhohita with the religion is formed of three carps tri-corporated under one head, and decorated with the flowers and stems of the sacred lotus. The carp is the only fresh-water fish which has attained mythical honours.

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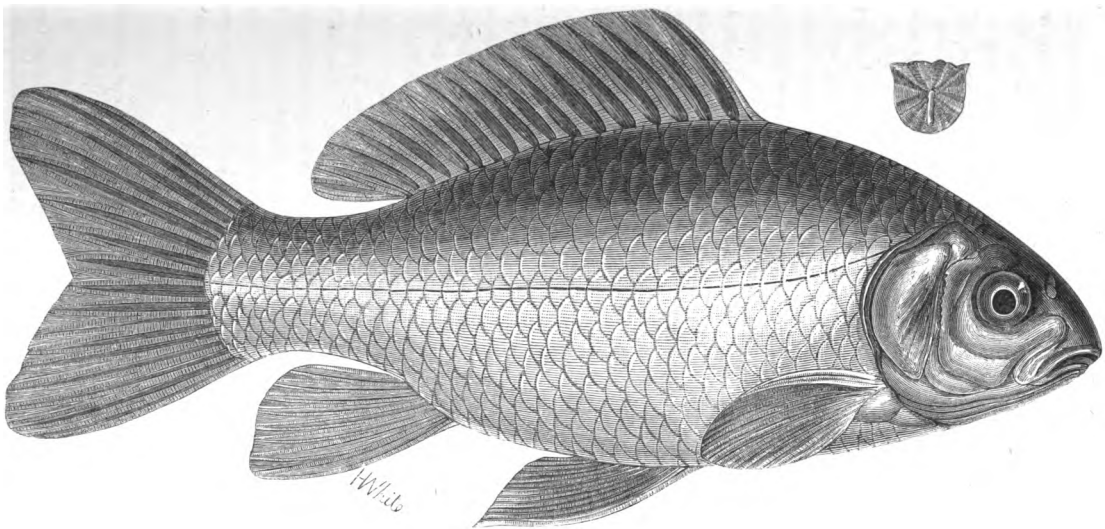

THE GOLD CARP—(*Cyprinus auratus*).

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We are informed in the "Whole Art of Fishing," 1719, that the "carp is a stately and subtle fish, called the fresh-water fox and queen of rivers"—queen of rivers, I suppose, on somewhat the same principle as that on which St. Ambrose terms the grayling "the flower of fishes." In Heraldry, Randle Holme, in his marvellous collection of knowledge, "The Academy of Armory," informs us the carp indicates "hospitality, and denotes food and nourishment from the bearer to those in need." The associations of carp history are therefore redolent of salutary lessons and good qualities, truly suggesting generally the sacred ideal of being wise as a serpent and harmless as a dove.

The date of the introduction of this fish into England is not quite satisfactorily proved. The old ryhme in Sir Richard Baker's "Chronicle"—

> Hops and turkeys, carps and beer,
> Came into England all in a year

—is of course not correct. Leonard Mascal asserts that he introduced them, and Walton speaks of the circumstance as follows: "It is said they were brought hither by one Mr. Mascal, a gentleman that then lived at Plumstead, in Essex." This assertion is, however, not true, for in 1486 Dame Berners says, "There be but few in Englonde," which is of course equivalent to saying there were some, but not many. Mr. Manley, in the work before quoted, says they were probably imported from Persia and naturalised in the fourteenth century, but does not give his authority—a grave omission. Still, one may safely assume that the carp was a foreign importation about that time. It was introduced into Sweden in 1560, and has since become perfectly naturalised there.

Shakespeare mentions it ("Hamlet," Act ii., scene 1), in Polonius' advice to his son, and both Massinger and Ben Jonson refer to the tongues of carps as eatables.

The artfulness of this fish is indeed remarkable. More than one writer has paid a tribute to this quality. Duncombe translates Vaniere's oft quoted eulogium in a capitally vigorous style:

> Of all the fish that swim the watery weed,
> Not one in cunning can the carp exceed.
> She oft will dive
> Beneath the net, and not alone contrive
> Means for her own escape, but pity take
> On all her hapless brethren of the lake;
> For rising, with her back she lifts the snares,
> And frees the captive with officious cares;
> The little fry in safety swim away,
> And disappoint the nets of their expected prey.

Another and more amusing poetical commemoration of the craft of the carp has been extracted from the "Censura Literaria," and published by Mr. Pinkerton. I have not space for more than a stanza

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or two. It is entitled "The Cunning Carp and the Contented Knight." "To the tune of St. George and the Dragon":

Within the wood a virgin ash
Had twenty summers seen.
The elves and fairies marked it oft,
As they tripped it on the green;
But the woodman cut it with his axe,
He cruelly felled it down,
A rod to make for the Knight of the Lake,
A Knight of no renown.
Turn and taper it round, turner,
Turn and taper round,
For my line is of the grey palfrey's tail,
And it is slender and sound.
St. George he was for England,
St. Dennis he was for France.
St. Patrick taught the Irishman
To tune the merry harp.
At the bottom of the slimy pool
There lurks a crafty carp;
Were he at the bottom of my line,
How merrily he would dance.
* * * * *
Moulded and mixed is the magic mass,
The sun is below the hill;
O'er the dark water flits the bat,
Hoarse sounds the murm'ring rill;
Slowly bends the willow's bough
To the beetle's sullen tune;
And grim and red is the angry head
Of the archer in the moon.
Softly, softly, spread the spell,
Softly spread it around;
But name not the magic mixture
To mortal that breathes on ground.
St. George, &c.

The Knight having risen at sunrise and duly arranged his tackle, begins to fish—but the "magic mass" is ineffectual.

The carp peeped out from his reedy bed,
And forth he slyly crept;
But he liked not the look, for he saw the black hook,
So he turned his tail and slept.
There is a flower grows in the field,
They call it marigold-a,
And that which one fish would not take
Another surely wold-a.
And the Knight had read in the books of the dead,
So the Knight did not repine,
For they that cannot get carp, sir,
On tench may very well dine.
St. George, &c.

But it was all of no use. The "sly tenant of the pool" was too old to be tempted into an indiscretion so flagrant.

Then up spoke the lord of Penbury's board,
Well skilled in musical lore,
And he swore by himself, though cunning the elf,
He would charm him and draw him ashore.
The middle of day he chose for the play,
And he fiddled as in went the line,
But the carp kept his head in the reedy bed,
He chose not to dance nor to dine.
"I prithee come dance me a reel, carp,
I prithee come dance me a reel."
"I thank you, my lord, I've no tart for your board,
You'd much better play to the eel."
St. George, &c.

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Notwithstanding the craft of the carp, however, there is an allegory in that curious old book "Dialogus Creaturam Moralizatus," which does not reflect a large amount of lustre on its artfulness. The grayling and carp, it appears, quarrelled at a great banquet of fish as to which should take precedency. After some considerable disturbance, during which physical collision seemed inevitable, a wily old trout suggested referring the matter to Judge Dolphin. "He is a nice and just fish," said the trout, "and will soon decide the question." The disputants accordingly went to the dolphin, and, having put the case before him, demanded his judgment. This he delivered as follows: "My children, you place me in a very awkward position; I am bound to do you justice, and how can I, having never seen either of you before? While you have been residing in fresh water I have all my life been rolling about in the restless waves of the ocean. Consequently, I cannot give a conscientious opinion as to which is the best fish unless I first taste you." Saying this he snapped them both up, and for the benefit of the bystanders gave vent to the following sentiment:

No one ought himself to commend
Above all others, lest he offend.

The beauty of the carp has not escaped notice either—

The yellow carp with scales bedropped with gold,

which appears in Pope's "Windsor Forest," is no fiction. Of course such a description is not applicable to the historic hoary old carp of the Pontchatrain fosse, but it eminently is so to a Windsor Park carp. There is a peculiar myth also connected with this feature, which Vaniere, the French Virgil (as he has been called) gives as follows (translated by Duncombe):

The carp which in the Italian seas was bred
With shining scraps of yellow gold is fed
Though changed his form, his avarice remains,
And in his breast the love of lucre reigns;
For Saturn flying from victorious Jove,
Compelled of old in banishment to rove,
Along the Italian shore a vessel found,
Beyond the lake of wide Benachus bound;
He for his passage at a price agreed,
And with large gifts of gold the master fee'd;
But he, the master, Carpus was he named,
With thirst of gain and love of gold inflamed,
Prepared in chains the passenger to bind,
But to the God his face betrayed his mind,
And from the vessel, in revenge, he threw
Into the waves the pilot and his crew.
Then into fish the traitors he transformed;
The traitors still, with love of lucre warmed,
The sailing ships for golden fragments trace,
And prove themselves derived from human race.

But this is an incipient libel on "Venus' own fish," and, as such, I reject it with scorn.

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The carp has been dragged into medicine, like nearly every other fish. The older physicians ascribed various miraculous powers to the fat. Amongst other diseases for which it was a remedy was a peculiar, now undefinable, disorder termed "hot rheumatism." The manner of its application was by frequent rubbing on the painful part, and the effect was eminently mollifying and salutary. A small triangular stone, said to be found in the jaws of carp (I have never seen it), on being ground to powder and applied to a bleeding nose was said to act as a styptic. The gall was used as a liniment for sore eyes; and "above the eyes," says an old Æsculapius, "two little bones exist, semicircular in shape, which are diligently preserved by noble females against the lunatical disease."

In the "Haven of Health" also the carp is comprised in the list of "ten sortes of fishe which are reckoned as principal in the preservation of health," and the author adds, "it is in great wholesomeness, of great value, and the tongue of the carpe is very pleasant to carping ladies."

Gastronomically I consider the fish good. Dame Berners styles it a "deynteous fysshe." The Germans make great resources out of its cultivation for food; they most esteem the head. The palates of carp have been long esteemed as a delicacy analogous, I imagine, to peacocks' brains and goose livers, for Couch speaks of having a note in his possession, written a century and a half ago, relating to the slaughter of forty-three brace of carp for their palates.

I wonder what they resemble in flavour—the famous nightingales' tongues of Heliogabalus? And thus Massinger in his "City Madam":

> Men talk of country Christmasses,
> Their thirty-pound buttered eggs—*their pies of carps' tongues*,
> Their pheasants drenched with ambergris, &c.,

and "rare" Ben Jonson compounds a kind of "hell broth" thus:

> The *tongues of carps*, dormice, and camels' heels,
> Boiled in the spirit of Sol.

Truly, a marvellous mixture.

Izaak Walton gives a most wonderful recipe for cooking this fish. He says: "Take a carp (first *catch* him, of course), alive, if possible, scour him and rub him clean with water and salt, but scale him not; then open him, and put him, with his blood and his liver, which you must save when you open him, into a small pot or kettle; then take sweet marjoram, thyme, and parsley, of each half a handful, a sprig of rosemary, and another of savory, bind them into two or three bundles, and put them to your carp, with four or five whole onions, twenty pickled oysters, and three anchovies. Then pour upon your carp as much claret wine

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as will only cover him, and season your claret well with salt, cloves, and mace, and the rinds of oranges and lemons; that done, cover your pot and set it on a quick fire, till it be sufficiently boiled; then take out the carp, and lay it with the broth in the dish, and pour upon it a quarter of a pound of the best fresh butter, melted and beaten with half a dozen spoonsful of broth, the yolks of two or three eggs, and some of the herbs' shreds. Garnish your dish with lemons, and so serve it up, and much good may it do you."

This, as the reader will admit, is a dish fearfully and wonderfully made, and not likely to be compounded by many of my readers. Any good cookery book, however, will give a recipe which, if followed with judgment, will make the carp excellent eating. The intestines of a healthy fish are said to be very beneficial to persons suffering with atrophy, from whatever cause, but, for my own part, I should take care to see the internal parts in a raw state first, lest the parasitic worms, with which even very healthy carp are infested, should be numerous. It would be unpleasant to get a tapeworm on one's plate. Soft-roed carp are sought after, and the roe is said to be also beneficial to persons of weakly habit. Be this as it may, I have no hesitancy in asserting that a well and clean fed carp of 4lb. or 5lb. is extremely destructive to the appetite when properly dressed and brought to table.

It being an exceedingly wary fish, the capture of a large carp may be fitly ranked amongst the *notabilia* of fishing. Nevertheless, carp are sometimes curiously voracious when of small and medium size. Thus, in the heat of a dead still summer day, I have succeeded in taking nine dozen of these fish, varying from ¼lb. to 2lb. Such takes are, however, I confess, exceptional, and it is curious to note that they only occur in the case of small or comparatively small carp, which, presumably, have not lived long enough to mature the wisdom of which they constitutionally possess the germs.

I have known in my experience some curious vagaries in the taking, &c., of baits by large carp, and still stranger behaviour when hooked. Of the former I may mention a sudden fit of voracity which prompted a six-pounder to take no less than three potatoes and hooks belonging to three different anglers, myself being included. We, of course, held the customary disputation as to whom the fish belonged, but I claimed it on the strength of my bait and hook being the deepest down in the gullet. I have read of a similar instance somewhere, and can quite believe it to be true. I have on several occasions taken small carp with the minnow when fishing for perch. When a large carp is hooked it has some very curious ideas as to behaviour. On several occasions I have had the line severed by the sharp spine in the back fin, and once I landed a fish

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properly hooked, but who, in its unsuccessful endeavours to get the gut across the aforesaid spine, had wound the line round and round its body so inextricably as to allow of its being landed tail first. Fortunately, the tackle was stronger than usual.

The tackle I use is of the finest description. The gut is usually a part of a fine fly-cast, in length about 4ft. or 5ft. The float—for it is ordinarily better to use a float—is a light quill. On the lower part of the gut, at about a foot or so from the hook, I attach a couple of large split shots. The float is so adjusted that, whilst one of the shots lies *on* the bottom, the other just deflects it from its horizontal position on the surface. The bait is a well scoured cockspur or red worm, and is impaled on a medium-sized hook. Of course the bait lies on the bottom. The rod should now be sustained in position by means of the spike or a notched stick, and the angler, if possible, should retire beyond it and watch. As soon as he sees the float assume an upright position the rod should be taken cautiously, and as soon as the fish has taken it away, say a few inches, in a decided manner, it is time to strike with firmness and decision. The first rushes of the fish must be controlled with equal firmness and discretion, lest a "smash up" result. I have never known this kind of tackle to fail if used judiciously. The line and rod should be fine and light.

A curious and ingenious, but troublesome, expedient for catching unwilling carp, is given by Mr. Fitzgibbon in his "Notes to Walton," and I think it is worthy of reproduction here. He says:—

"A correspondent not long since wrote to me for advice. He had a pond in which were many large carp, and although he had angled for them in due season, from February to October, during seven years, he had not succeeded in capturing them. I advised him to line with hurdles the bank of the pond at the spots where he meant to fish, to ground-bait those spots with red worms, gentles, and especially with sweet paste, for three or four days, to then take his rod, and supporting on a bifurcated prop (cut off the branch of a tree) inserted in the bank behind the hurdles, to place on this line a hook broken off at the bend—that is, without barb or sharp point, to bait this harmless hook with sweet paste, and to sink it nearly to the bottom of the already ground-baited water. The carp will soon take this bait, and finding they can do so with impunity, they will become bolder hourly. Replacing the bait every time it is nibbled off, and continuing to do so for three or four days, commence then angling in earnest. With the same rod and line, but with a barbed hook baited exactly as before, come behind the hurdle, and with very light float angle cautiously. My correspondent acted on my advice, and succeeded in catching as many of the large carp as he wanted."

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The baits, as might have been supposed by the variety of food in which *Cyprinus carpio* indulges, are many, and require discrimination in their general ordering, as, indeed, they do for all fishes. More especially, however, is it necessary to cleanse the worms from all impurity, and to scour the gentles, if the latter be used. The first-named baits are much the best, in my opinion, for general carp fishing, and although it is certain that failure of sport must sometimes occur, yet I can safely say that when fishing in carp ponds I have never failed to get a fair day's sport by judicious baiting and careful fishing.

In order to give the reader some idea of the nature of carp angling, I may be allowed to briefly narrate my own experience in the capture of a 9lb. fish. It is well known amongst anglers that some enormous carp are to be found in Virginia Water, and I have seen them on calm bright summer mornings basking at the surface with just the back fin above water, rather resembling logs of wood than fish. I had for a long time coveted one of these beauties, and for hours over a pipe had pondered the ways and means, till, to quote Hood, my "heart was sick and the brain benumbed." I had gut tackle, fine twist lines, suitable rods galore, but a problem still eluded solution, and that problem was how to get the bait to them. It must be borne in mind that their basking water was usually quite two hundred yards either way from land. Of course the punt was at my service, but the difficulty was approaching within fishing distance. Immediately one got nearer than about thirty yards they were *non est*. After much consideration, however, I decided to try once again with different tactics. Behold me, therefore, reader, on the morrow, just as the "eye-lids of the morning" were opening, equipped with a Well's four-joint trout rod, a fine twist line, a spring reel, and fine three-yard gut cast, to which was attached a single No. 6 hook, wending my way towards the lake. This reached, I was soon within fifty yards of the leviathans, slowly patrolling the water beneath the bright sunbeams, and after carefully dropping the weight into 30ft. of water, I sat down quietly to arrange the tackle. A breeze was softly rippling the water, and my idea was to float the light tackle to the wily fish, and trust to my skill in hooking and playing one at that great distance. My bait was a fresh green pea, which I now extracted from its pod, and impaled on the hook, so as to almost completely hide the shank, but leaving the point just through. Taking a large chesnut leaf that happened to lie in the punt, I slipped the gut through its centre, so that it would form a sort of kite or sail for my bait. Raising, then, the rod aloft, and rapidly letting the line run from the reel, I had the satisfaction of watching the gradual approach of my bait to the as yet unsuspicious carp. Slowly onward it went through the air for twenty yards, and then softly dropped on the

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water, to be borne as on a stream precisely to where the huge fishes lay. At last the shoal was reached, and, retained by my line, the bait and leaf remained stationary—some few seconds fraught with terrible suspense. All on a sudden down went the leaf, the line tightened, and a terrific rush told that a *Cyprinus carpio* had found his match. Now came the Greek-to-Greek combat. Right and left in turn, now down to the bottom, anon quite at the surface, was the fight prolonged; but, as far as Master Carp was concerned, it was in vain. After an hour's good sport—such sport as I never but once before experienced—he was landed, scaling 9½lb. He was probably one of the smallest of those whose back fins I had seen. I have simply given this episode as illustrative of the difficulties one has to overcome sometimes in carp fishing. Of course, when carp are near to spawning, and shortly after, when they are close together, and jostling each other with affectionate demonstration, it is a matter of little difficulty to catch them; but given the exigencies of the example I cite, and the carp indeed proves himself a "wit."

It has been the usual custom of writers on angling to connect the carp and tench under one category. Why, I know not. The same mistake is made in regard to roach and dace; but of this I shall have to speak in another chapter; there are certainly some points of similarity physiologically between carp and tench, such as power of endurance of heat and cold, but to the angler proper they are as different in habits as chalk is from cheese, to use a homely metaphor. Carp ever bite best during the early hours of morning, and tench are generally best "on" towards evening. Carp can be taken best during the early summer months. I have known good tench biting freely on a dull January day with the wind due east. I have, however, never caught carp under such circumstances.

In giving general directions to such anglers as are not experienced in carp fishing, let me impress one or two indisputable truths on them for their guidance. Fish with the *lightest* tackle compatible with strength; never use a large long-shanked hook; cover the shank of the hook when baiting; let the bait rest on the bottom; let the fish have the bait while you count five; give plenty of time to kill the fish; your hook will never tear out of the gristly mouth; put no shots near the hook; and finally, when a fish is hooked keep perfectly cool and deliberate.

The most useful bait for general fishing is the lob worm or the red worm; next to these I like a bluebottle fly. Of this bait Mr. Blakey says: "No matter how small your hook, it must be put across the body just under the wings." For large carp, as I have indicated, the green pea, cherry, green corn, or new potatoes may be used with success. It is necessary to use a small triangle hook for the latter bait, putting it on

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by means of a baiting needle, thus hiding the hook completely and giving your fish time to pouch, or at least to pass it beyond the teeth in the throat before referred to.

It is highly necessary sometimes to ground bait the spot you intend to fish. The following preparation has been recommended, but I imagine that most experienced anglers will readily perceive it errs from extreme elaboration: Take a quantity of well cooked veal, a handful of oatmeal, and a little honey; bruise them in a mortar, mix them in a thin paste or batter with new milk and a few grains of assafœtida. Crush down in a mortar a quantity of worms, gentles, slugs, and some lumps of the most tallowy cheese you can find, thicken the veal batter with this compound, and then roll it up into little balls; these balls must be thrown into a compost of tallow greaves and grains steeped in bullock's blood, and the entire mess sunk in the place some hours before fishing. This is Blakey's prescription. There are no less than twelve ingredients, besides trouble of procuring and compounding, and after all has been faithfully done one may go out, as I did on one occasion, after mixing up this unspeakable mess, and—tell it not in Gath—catch nothing.

The best and simplest ground bait I know of is pearl barley or even boiled rice, using boiled pearl barley or a red worm for the hook bait. I have usually found that immediately after a thunderstorm is a good time to fish; and let it not be forgotten that the early bird ever gets the pick of the worms, or, as in this case, fishes.

The best spots in the Thames for carp, as far as my experience goes, is in water from 3ft. to 6ft. deep, where there are plenty of large stones and the long tape weed, from which it picks considerable quantities of animalculæ and water insects. I have in my "mind's eye" a certain spot by the dilapidated trunk of a willow on Chertsey Mead, by which the water gently swirls over rocky prominences and through a wild growth of weeds, alternated with clear intervals of gravel. Here have I seen many a two and three pounder somnolently basking in the morning sun, although I never caught one from the place.

In conclusion of this chapter on carp I may be allowed to jot down a few recorded weights of these fish. I have myself seen them of 18lb., but according to Donovan they attain a prodigious weight in Germany. He says: "One was taken at Dertz which weighed 38lb. In Prussia they frequently weigh 40lb., and in the Volga they are 5ft. long. One caught near Frankfort-on-the-Oder was 9ft. long and 5ft. in circumference, weighing 70lb. Lake Zug, in Switzerland, produces carp of 90lb.; and in the Dniester some had been taken of which knife handles are made with the scales. Carp do not arrive at this prodigious size until they are of a very advanced age." I should think not.

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In Shaw's "Zoology," it is said: "They are sometimes caught in Lago di Como, in Italy, weighing 200lb."

Dr. Block records a carp taken in the domains of Count de Schulenbourg, in Saxony, that weighed 32lb.; but Jovius and ancient writers, mention some much larger.

According to "Dodsley's Register," 1761, "Mr. Ladbroke, from his park at Gatton, presented Lord Egremont, with a brace that weighed 35lb. In 1793, at the fishing of a large piece of water at Stourhead where a thousand brace of carp were taken, the largest was 30in. long and 22in. broad, and weighed 18lb."

A Mr. Milward had also drawn carp from his marl pits weighing 25lb. a brace, and having 2in. of fat upon them. They were fed upon peas.

It is further said "that a brace of carp were presented to the Princess of Wales, weighing 28lb., caught in a pond near Godstone, Surrey."

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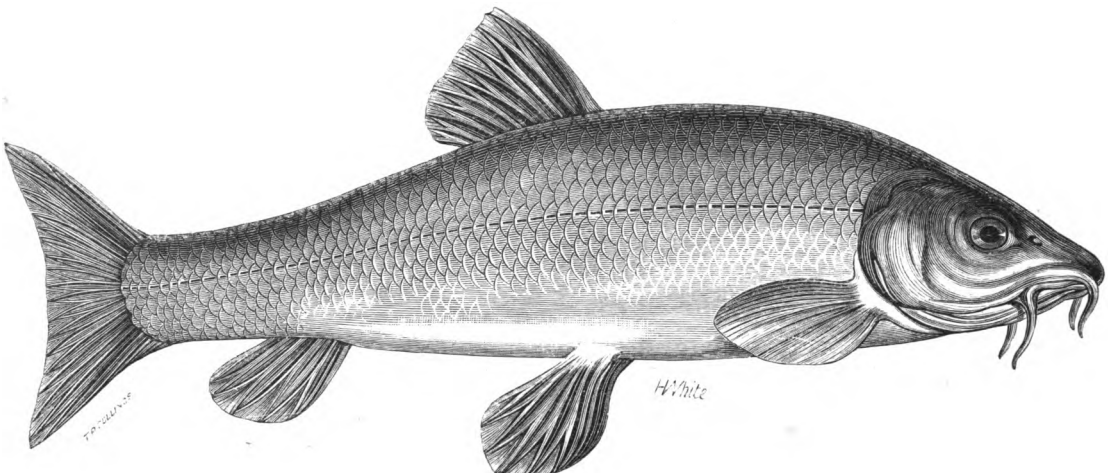

THE BARBEL (*Barbus vulgaris*).

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CHAPTER IX.

THE BARBEL.

THE barbel (*Barbus vulgaris*) is distinct in its chief characteristics from the *cyprinus* genus by reason of its anal and dorsal fins being shorter, its having a bony spine in the back fin, and possessing four barbs instead of two only. Its principal features are thus technically described by Mr. Pennell: Mouth toothless, throat teeth in three rows on each side, the rows numbering 2, 3, and 5 respectively. Body elongated. Length of head compared with total length of fish as 1 to 5. Depth of body less than length of head. Head elongated, wedge-shaped, upper half of jaw much the longer, upper lip circular and fleshy, one pair of barbel at front of nose and a single one at the end of upper lip at each side. Third ray of back, fin largest and strongest-toothed on its hinder surface. Tail deeply forked at the end. Colour: general hue of upper part of head and body greenish-brown, becoming yellowish-green on side; cheeks, gill cover, and scales tinged with bronze; belly white; back and tail fins brown, tinged with red; pectoral, ventral, and anal fins pale red.

The fecundity of the barbel is great. It spawns from May till July, according to season. As many as 10,000 are sometimes laid by a female of some 6lb. or 7lb., and they are immediately covered up by the parent fish. The spots selected are usually shallow, and the fishes make a nest somewhat after the style of the *salmonidæ*. Like the salmon also, the old infecund cock fish may often be observed tearing up the spawn beds and eating the eggs.

Barbus vulgaris is well known in almost all European rivers. After the difficulties of the spawning season are surmounted, they make their way into the strongest streams, and occupy themselves in scouring and improving their strength and appearance by eating enormous quantities of water insects. Izaak Walton accounts for the astonishing

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immobility of the barbel in swift streams in a very peculiar way. "With his beard or wattles," he says, "he is able to take such a hold of weeds and moss that the sharpest floods cannot move him from his position." Of course this statement is unreliable.

This venerated author further goes on to say, "He seems to have the power of rooting in the mud and, pig-like, wallowing in the mire and weeds at the bottom of deep holes and under overhanging banks." It should be added that this latter assertion applies truly to lakes and deep streams only.

The food of this fish is exceedingly various, like that of the carp. Flies, bees, beetles, maggots, worms, slugs, snails, and all similar baits, as well as occasionally live fry, gentles, leeches, meat cooked and raw, hard-boiled eggs, and cheese may be included in the list. The cad bait in early summer is, however, the best beloved of all the dainties.

Besides these and the entomastraca and crustacea of the water, it also it does not object to a spring salad of *Conferva rivualis*—the green weed growing on weirs and stones in swift-running streams, and is said to be especially eager after the Thames lampern when it visits the river in autumn. The size to which the barbel attains is probably in no case beyond 18lb. in English waters. In the warmer parts of the Continent they grow, however, much larger, and Cuvier says they sometimes in favourable localities grow to 10ft. long. In the Volga they are said to occasionally scale 40lb. or 50lb. The barbel, like the carp, is affirmed to utter a croak when being drawn up from the water. The sound, however, emitted is not a genuine guttural sound, but, like the gasp of the slime-ladened branchia of the eel, is a simulated choking sound, which might easily deceive an unobservant angler. A similar vocal performance is reported of some Welsh trout from the Carraclwddy pools. These are reported to be suffering from a bewitchment. The sound, however, has been accounted for by a writer in the late *Fisherman's Magazine* by the supposition that the "croak" emitted is but an unsuccessful attempt on the part of the trout to speak Welsh.

Of all other fresh-water fishes barbel seem the most subject to internal parasites. Dr. Cobbold, as before mentioned, in his "Synopsis of the Distomidæ," says that no less than 126 of the "fluke" species of entozoa are to be found in fish out of 344 distinct classes, and that they are particularly abundant in *barbel*, bream, and eels. This fact is accounted for by these fish inhabiting deep, still water for the most part, being slow, comparatively, in their habits, and feeding principally on earth or gravel insects. The thorn-headed worms

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are very frequently found. The large intestine or colon of the barbel is sometimes studded with the *Echinoshynchus anthuris*. This creature, be it remembered, has a head cone-shaped, studded with incredibly sharp thorns set barb-wise. It seems to bore like an auger, or, better still, like the teredo worm, which so frequently pierces and destroys the bottoms of wood ships sailing in the tropical seas. A finely-mounted specimen of the head of an anthuris was exhibited at the *conversazione* of the Quekett Microscopical Club by Mr. W. Smart, on the 13th of April 1877.

The cestodes, or larval tapeworms, are also very common in the intestines of barbel, and I recently took one (*Ligula digramma* of Cieplin) from a fish of2lb., which measured 18in. *Barbus vulgaris* seemed very little the worse in condition for his intrusive lodger. This worm finds its host, and progresses to its full development, in the heron or moorhen.

Amongst other diseases incidental to barbel may be mentioned, as most virulent of all, the malignant pustule, and next to this a soreness, which seems to result from the fish in certain situations incessantly rubbing itself against concrete blocks or limestone buttresses of bridges, or anything, in fact, which contains lime. I have met with cases of this kind where the barbel seemed disabled in the pectoral fins from this disorder. A "leperous" confervoid growth also afflicts this fish, which, together with the former complaint, as in the case of the carp, may be cured by rubbing the affected parts with salt and turning the patient in again.

Barbel also seem to die from obstructions caused by their ravenous consumption in spring of the before mentioned *Conferva rivualis*, a bright green weed which in the Lea has been eminently successful in the capture of roach during late years.

Jonston refers to Albertus as witness that in the Danube as many as ten cart-loads have been caught by hand on one occasion only. Ansonius, speaking of the Moselle barbel, avers that it is best for eating when it grows old—just the reverse of the carp, it may be remarked. Juvenal also reverts to the fish with familiarity, as if it were well known in the Roman cuisine. I may be allowed to give a free translation of the passages. In the philippic against Cryspinus it is said: "He gave six sestertia for a barbel six pounds weight, amounting to a sestertium a pound, as they tell the story who hear great matters, but make them greater by telling. . . . . What! give so much for fins and scales? No doubt you might have bought the fisherman cheaper than the fish. Acres might have been purchased in some provinces; in Apulia you might have come into an estate for the same price." The quotation certainly justifies the inference

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that the barbel was not thought a great deal of by Juvenal, however much Cryspinus esteemed it. Possibly Juvenal was but little of a judge n gastronomic affairs. I certainly think a barbel by no means despicable. Plutarch also mentions the fish to give an interesting observation on a peculiarity of its natural history. Barbel are, therefore, of ancient pedigree.

The ova or roe of barbel has enjoyed an unenviable notoriety for poisonous qualities. Badham, in "Prose Halieutics," gives an instance of its pernicious influence on the human economy. "Antonio Gazius," he says, "took two boluses, and thus describes his sensations: 'At first I felt no inconvenience, but some hours having elapsed, I began to be disagreeably affected, and as my stomach swelled, and could not be brought down again by anise or carminatives, I was soon in a state of great depression and distress.' His countenance was pallid, like a man in a swoon, deadly coldness ensued, violent cholera and vomiting came after until the roe was passed, and then he became all right."

Dame Julyana Berners also attributes bad qualities to the flesh. "The Barbyl," she says, "is a swete fysshe, but it is a quasy mete, and peryllous for mannys bodye. For comynly he ynyth an introduction to ye Febris; and yf he be eten *rawe*, he maye be cause of mannys dethe, whyche has oft been seene."

In explanation of the latter sentence, it may be observed that there is reason to suppose that in former times the eating of uncooked fish and flesh was customary. In the "Pictorial History" (vol. ii., p. 254) is a picture of a perch placed in such a position as to lead one to suppose it was intended to be eaten *raw*. In the "Governayle of Healthe," printed by Caxton, the following occurs in reference to the eating of raw meat: "For healthe of bodye cover for cold thy head, eat no raw meat; take good heede thereto." And it may be remembered that the custom is forbidden in times more ancient still (*vide* Exodus, chap. xii., ver. 9).

Now, in reference to this alleged poisonous quality of the barbel, I am quite convinced that no such quality exists. I have eaten barbel cooked in every conceivable way, and I have made a point of testing the roe on frequent occasions, although I have never eaten the fish raw. Nevertheless, my cat has, and so, I am sorry to say, has my dog, who has a particular but unnatural liking for raw fish; and I have never observed any prejudicial symptoms consequent in either. Possibly, in a few cases, the fish out of condition may have been eaten, and possibly gastro-intestinal inflammation, terminating in death, may have been induced in the human being, and so the fabric of its assigned poisonous nature has been raised. I am persuaded, however, that barbel are as wholesome as most other fresh-water fish.

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As every barbel fisher is aware, it is absurd to expect a good day's fishing unless a place is properly and copiously baited. For this purpose it is usual to employ worms. Other messes are used, such as that for carp, spoken of in the last chapter; but worms, gentles, or greaves seem the most reasonable, and are, I believe, the most effective of all enticements. I ordinarily have the worms I use from Nottingham, where it is a business to collect, cleanse, and toughen them for market. Should, however, the tyro choose to spare expense by preparing his own, he may do so by passing them through the ordinary *sphagnum* moss. A few tea-leaves may be advantageously sprinkled amongst them. This toughens them yet more. Or the following is a good plan: take the worms and put them in bran for about six or eight hours (longer is apt to kill them), then take them out and put them into damp moss for a day or two. This process renders them very tough, and in a shorter time than if prepared in any other way. In Thames barbel fishing it is always my custom to first ascertain by ocular demonstration, if possible, how many, approximately, are in a given place. This is best done on very bright mornings, when the punt may be floated over the spot. If the number be so considerable as to give the idea that it is a home of these fish, the place is decided on as fit for preparation. The preparation is as follows: I rake the bottom with a gudgeon rake, if possible, first. This is for the purpose of setting free the numberless insects inhabiting the immediate stratum, which are naturally very attractive, being the staple of the ordinary food of the fish. After this, a quart, say, of worms entire, not cut up, is sunk in the midst of where the barbel lay. The reason why I advise the worms being thrown in entire is as follows: a worm lively and entire will live in water some three days, whilst if cut in pieces and it remains at the bottom not eaten, it decays and sickens the fish, for barbel are easily sickened. The worms are sunk entire, therefore, usually by allowing them to crawl first into a fresh sod. This is done in the morning, if practicable, because there are few eels about to pick them up. The next quart is hand-strewn, so as to fall at about a yard from the former lot, and so on up stream for six or seven mornings, or nights, as the case may be, until a train of worms is laid to some ten or fifteen yards away from the "home." Bait at, as nearly as possible, the same time on each occasion, and, finally, miss one morning, letting that be the one on which you fish. Let the baitings be at least twenty-four hours apart. The advantage of this method is that you get a crowd of eager, waiting, hungry fish out of their accustomed haunt, in "fresh fields and pastures new," where no leger before has, perhaps, rolled down upon their backs with insolent pertinacity, and it is a clear swim with light float tackle,

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the worm skipping over each stone right into their waiting mouths. Your success in such case is sure.

The tackle should be of the lightest description compatible with strength; for, notwithstanding that, as the "Book of St. Albans" says, "the barbyl is an evil fysshe to take, for he is so strong enarmyed in the mouthe that there may be no weake harnesse holde him;" he, nevertheless, is a wily customer, and requires very choice "tools and baytes" for his destruction. The running Nottingham tackle is, in my opinion, incomparable, such, for example, as Bailey uses. Always, let it also be said, fish from the bank if possible.

This Nottingham tackle, of which the reader cannot fail to see I am deeply enamoured, is easily obtainable and very cheap. I shall, in the chapters on tackle making, hereafter describe it minutely. For the present it is sufficient to say that it consists of a light rod, light running wheel, the finest silk line compatible with strength, and fine drawn gut, with a superior make of hook attached, all to be got of Wells, 1, Sussex-street, Nottingham; or James Bailey, of the same place. The "leger" style is also much liked by the "Quietist" sort of anglers, who prefer sitting and waiting for the "knocks" of the fish to searching for them with the travelling float. In very swift streams it is, however, sometimes impossible to use the float; in such case, of course, the leger is the only style admissible.

That I may not rest under the imputation of insufficient explicity, I may here fitly explain the old-fashioned "leger" referred to. Briefly, it consists of a length of stoutish gut and a bullet or leger (leger, Anglo-Saxon, lying; from licgun, to lie) which is ordinarily a cylindrical drilled flat lead—a largish sized hook, and a shot or other stay to retain the leger in its place on the gut. The best form of this tackle consists of the leger painted a dirty brown to resemble the ground on which it is destined to lie; the bullet or leger is also placed on a piece of gimp, it being found that the friction causes the gut to soon wear out, and two shots are found useful to confine the leger to the space occupied by the gimp. For my own part I prefer a bullet, finding that I can the more readily by letting out a little slack line shift the position of the bait without making an additional cast. A modification of the leger tackle, which is a true hybrid between float fishing and the leger, is termed "tight corking." In this method the ordinary weight is used as with the former, and a float is attached, which is not stayed on the line as in the case of the Nottingham style referred to. It runs loose, and consequently rises to the surface at an obtuse angle to the bottom, the surface, and the angler. The float also lies almost horizontally on the water, and assumes a perpendicular position when the fish bites. As will be seen in the chapter on Roach, it is also

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applicable to the capture of that fish, and is preferable, under certain conditions, to any other method, because of its extreme delicacy of indication when a fish takes the bait. The best floats are either entirely of cork or of swan or turkey quill—cork, and of moderate size, for deep and somewhat rapid streams, and quill for shallower and quieter waters.

In concluding this chapter on barbel fishing, I must impress upon my readers the necessity of quietude and care when fishing—especially with the leger. Not only is it necessary to avoid violent movement in the punt, but in my opinion the forcing in of the ryepeck for the purpose of fixing the boat is often exceedingly prejudicial to the success of the day, not unfrequently putting the fish completely off the feed.

I am aware that I am perhaps rather fastidious, and there are few anglers likely to give up the convenient ryepecks on this account, but when it is considered that the grating of the iron point of the pole in the gravel can be heard under water for at least a mile, what has been said will appear worth attention. Owing to electrical causes chiefly, all ground fish are at times nervous and shy, and it is at such periods that the quietude referred to is most necessary. For the fixing of the boat, my plan has been to lower from head and stern a heavy weight, and this gradually, and with care. It will be found that there is little difficulty about doing so, and the boat is just as stable.

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CHAPTER X.

THE TENCH.

THE tench (*Tinca vulgaris*) is (next the carp) perhaps the most interesting of the coarse fish. He is described by "Ephemera" as a "mucous blackish olive carp"; but more truly by Blakey as a "handsome thick fish, of a greenish yellow colour," and most satisfactorily of all by Mr. Pennell, as follows: "The length of the head alone being considered as 1; the total length of the head, body, and tail fin not quite as 5; depth of the body at the deepest part, one-fifth more than length of the head; all fins rounded at the extremities. Tail fin not at all forked, nearly square, with the corners rounded off; mouth small, toothless, with one barbel at each corner; scales very small. Colours: Head, sides, and cheeks golden green, darker on the back and fins, orange yellow under the belly, irides bright orange-red." The measurements and description are applicable, of course, approximately only to all tench, in good condition of growth and health. The word tench is from the Latin *tinca*, French *tenche*, and probably is derived from an allusion to its soft-sucking lips. Cicero is reported to have satirically applied the epithet *tinca* to a brother orator, probably also alluding to a peculiarity of mouth.

Tench are usually colloquially connected with carp. Why, is not apparent. In some very important points it would be difficult to find two fish more dissimilar. The carp, for example, has the largest scales of any member of the family; the tench possesses the smallest. The general hue of the carp is gold and bronze, and that of the tench a deep olive green. Carp are generally admitted to be a most attractive bait for pike; whilst the tench is well known to exert positively a repelling power over the "tyrant of the watery plain." In its habits it is also

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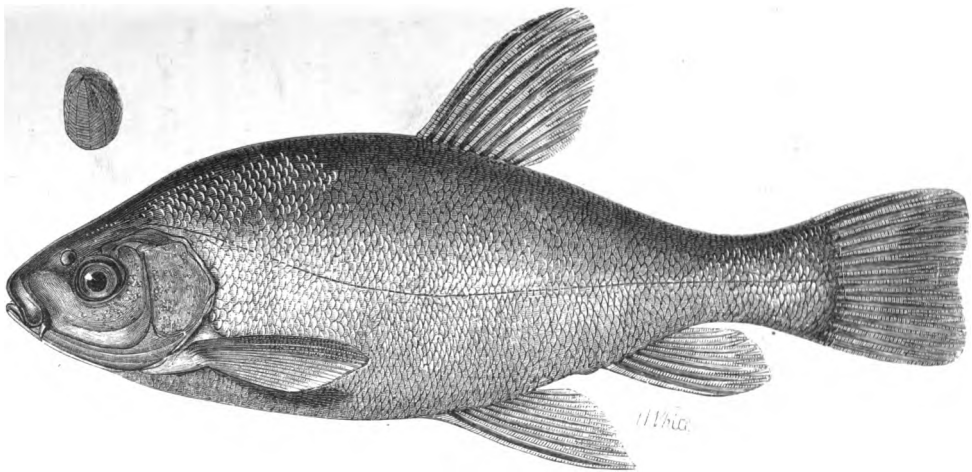

THE TENCH—(*Tinca vulgaris*).

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widely different to the carp, although it must be admitted that both fish are almost always to be found together in lakes, if not in running streams.

Willoughby says the tench spawns when the wheat is in blossom, which is invariably true. And a curious season this is with tench! The homely saying, "Mad as a March hare," might have an equally forcible analogue in as "Mad as a June tench," for mad or foolish they are at this interesting time, and may be readily taken by the hand. I have repeatedly seen the males chasing their fair partners so roughly as to so completely disorder their faculties that they have leaped on dry land and been secured. Their ova is greenish in hue and prodigiously numerous; in a female weighing 3¼lb. no less than 297,000 eggs have been estimated.

The male fish is distinguishable from the female by the curious shape of his ventral fins. In the female they are of ordinary size and make, but those of the male are much larger and more muscular, and look like a green concave shell, the concave side being uppermost. About fifty years is the greatest recorded age of tench. They may, like bream and carp, be carried long journeys in wet moss, being extremely tenacious of life.

The habitat of the tench, like that of the grayling, seems to be somewhat local. It is, however, found all over England, Holland, and rest of the European lake provinces, and it was said to have been first introduced into England in 1514. In Ireland there are but few of these fish, and still fewer in Scotland. The tench seems to thrive and multiply best in muddy water, old clay pits, and such like excavations, and its faculty of burying itself in the mud is well known. A tench weighing 11lb. is said in "Daniel's Rural Sports" to have been taken from a choked up pit, where it had probably been for many years. This is the account: "A piece of water which had been ordered to be filled up, and into which wood and rubbish had been thrown for years, was directed to be cleared out. Labourers were accordingly employed; and, almost choked up by weeds and mud, so little water remained that no person expected to see any fish, except a few eels; yet nearly two hundred brace of tench of all sizes, and as many perch, were found. After the pond was thought to be quite free, under some roots there seemed to be an animal which was conjectured to be an otter; the place was surrounded; and on opening an entrance among the roots a tench was found of most singular form, having literally assumed the shape of the hole in which he had of course for many years been confined. His length from eye to caudal fork was 33in.; his circumference, almost to the tail, was 27in.; his weight 11lb. 9½oz.: the colour was also singular, his belly being that

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of a charr or vermilion. This extraordinary fish, after having been inspected by many gentlemen, was carefully put into a pond, and at the time this account was written, twelve months afterwards, was alive and well." The usual size does not, however, exceed 3½lb.

The food of the tench is very similar to that of the carp. It lives on vegetable matter and small water insects, which it does not disdain in some cases to rout up from the mud.

The title of "physician of fishes" has been given to tench, and the qualities which render the title just seem to lie at the root of the immunity it experiences at the hands (or mouth) of the pike. According to both ancient and modern authorities, the thick slime with which it is covered effects a salutary influence on both itself and compeers. Out of a hundred instances on record where their Æsculapian influence has been manifested, it is sufficient to cite one. Mr. Wright, in his book on "Fishes and Fishing," thus states the case:

"A gentleman, who was unfortunately unable to leave the house for some time through an accident, amused himself by making small artificial flies, which he did very neatly. He kept some minnows and a tench, about 2½in. long, in a very large wide-mouth bottle; all the minnows had died except one. My friend was just finishing a fly as I went into his room, and he held it upon the surface of the water in the bottle, as he was often in the habit of doing. The minnow darted at it so rapidly that he could not withdraw the fly in time to prevent the hook from pricking the minnow. The little fish descended three parts of the way down the bottle, poised himself for a moment, with his nose pointing downwards, then swiftly went the remainder of the way, rubbed his nose, during a few seconds, against the side of the tench, and again swam about as lively as before. We both joined in the opinion that it is really no fable as to the tench being the Æsculapius of fishes, for here was an example before our eyes of a fish being wounded, and immediately instinct directing him to seek a remedy."

Camden, also, in the "Britannica," when speaking of the fish-stews of Southwark, says: "I have seen the bellies of pikes which have been rent open have their gaping wounds presently closed by the touch of tenches, and by his glutinous slime perfectly healed up."

In consequence of this benignant quality, the pike refrains, be he never so hungry, to make a meal of the tench. Fitzgibbon, Hofland, Salter, Hollinshed, Walton, Oppian—all concur in believing this. If it really be a fact—and, in my own experience, I have no reason to doubt it—the pike has, at least, one virtue, seldom found, indeed, even in humanity—namely, gratitude. Mr. Pennell says: "I procured some small

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tench, and fished with them as live baits for a whole day in some excellent pike water, but without getting a touch. In the evening I put on a small carp, and had a run almost immediately. I also tried some pike in a stock pond with the same tench, but they would not take them ; and, though left in the pond all night—one on a hook and one attached to a fine thread—both baits were alive in the morning, some pike marks being visible, however, on the hooked fish." Salter also tried a similar experiment, and found that every trimmer but those baited with tench had "fished." An admirable poetical version of the matter is as follows :

> The pike, fell tyrant of the liquid plain,
> With ravenous waste devours his fellow train;
> Yet, howsoe'er by raging famine fined,
> The tench he spares—a medicinal kind;
> For, when by wounds distrest and sore disease,
> He courts the salutary fish for ease;
> Close to his scales the kind physician glides,
> And sweats a healing balsam from his sides.

Nor are his medicinal properties only applicable to the "liquid plain." Rhondeletius says he saw a miraculous recovery by the application of a tench to a sick man's feet. It has also been deemed beneficial in cases of headache if applied alive to the brow; and if planted on the nape of the neck it is also said to relieve inflammation of the eyes. I myself know of a complete cure of a bad case of jaundice by the agency of a tench. The fish was split open and the inside and backbone taken out ; it was then tied over the region of the liver, and in three days the cure was almost perfect. The tench was found dyed a complete greenish-yellow hue on being taken off. Who shall now, therefore, deny this fish its title of "physician?"

Gastronomically, the tench is variously esteemed. An old Silesian physician seems to have been very prejudiced against it. He says : "The tench is a vile, neglected fish, very flabby and glutinous, bad for digestion, a food fit only for paupers and serfs." I doubt not M. Soyer would have induced him to revoke his opinion had he tasted one prepared after the prescription of the great *chef*. My own opinion is that, if carefully cooked, it is a decided acquisition. Pennell says, *apropos* of the gastronomic qualities of *Tinca vulgaris* : "Like the eel, it would appear to be palatable in a precisely inverse ratio to the cleanliness of its abode, improving in gustatory attractions as it approaches more nearly in colour and diet the composition of its habitual mud. Thus, 'tench were taken out of Munden Hall Fleet, Essex, which was so thick with weeds that the fine nets could hardly be sunk through them, and where the mud was intolerably fetid and had dyed the fish of its own hue, which was that of ink ; yet no tench could be better grown, or of a sweeter flavour.' . . . . 'In a clear pond at Leigh's Priory a quantity

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'of tench were caught, of about 3lb. weight each, of a colour the most golden and beautiful; but when dressed and brought to table they smelt and tasted so rankly that no one would eat them.'"

I must beg to differ, however, from this, having always found it necessary to scour tench in clean water for a week previous to cooking; besides, everyone knows that clear-running streams produce the best and cleanest eels. I must differ from Mr. Pennell's assertion, therefore.

The tackle to be used in the capture of this fish is sufficiently simple, and consists of the ordinary appliances in use for all the carp family. In the chapter on carp I referred to the wide-spread idea that some sort of connection existed between the two fish, either in habits or in physical relation. This idea, like many others which have as widely obtained, is quite untenable and devoid of foundation. The two fish, it is true, thrive fairly well together, but they are by no means inseparable or even invariably associated. I can at this time point to half a dozen pieces of water which, while containing carp, have no tench, and *vice versâ*. Beyond the fact that fineness of tackle is necessary in angling for tench, there is no more similarity between the method of angling for them and carp than between the style in vogue for roach and that for carp.

In fishing for tench it is advisable, of course, to use the very finest gut or hair bottoms, and it is also necessary that the hook be not too large, and that the bait rest on the bottom. Nearly all the fresh-water flat fish take their food standing as it were on their heads, and they make no exception when taking a bait on a hook. The bait is first investigated very closely by the brilliant-eyed tench, then turned over gently, and finally taken in the mouth and held there for some few seconds; if it be not approved it is rejected, but if the fish be satisfied it is passed on down to the saw-like teeth in the throat, the fish meanwhile moving somewhat away from where the bait was taken. Immediately, therefore, if the bait has rested with some few inches of loose gut on the bottom, that the float bobs, it is necessary to strike, not too savagely, but with sufficient decision to fix the hook in the soft succulent lips of the fish. A few mad plunges and borings characterise the struggles of the fish, and the result is as per usual. The lightest quill float should be used, and the time of most frequent capture is early morning and late evening. I always, in fishing late at night, especially in summer, when tench are most frequently to be taken, arrange a piece of white paper or a white feather on the top of the float, so that when the said float is moving its motion is easily perceived, and an additional certainty added to the strike.

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As to baits, I prefer in ground baiting to throw in lobworms *whole* for spring or autumn tench fishing. For summer tench fishing blood, grains, or ordinary carp or roach ground bait, is good, using sweetened paste or a red worm well scoured. The tail of a lobworm in autumn is very killing ofttimes, and a wasp grub in June, just after the spawning of the fish, is considered by some a splendid lure. It certainly may be a successful lure, but not ever having tried it, I am unable to verify the statement. It is hopeless angling for these fish during cold weather, and I have ever found that close, mild, "muggy" weather, with a dash of thunder in it, is that in which the greatest sport is generally got. During a drizzling rain in the early part of September, 1870, I got ten handsome tench from a lake in Gloucestershire (near Gloucester), all in about two hours.

The tench is more capricious than a barbel. In early spring I have repeatedly caught them with a modification of the eel "bobbing" tackle, the difference in the tackle being the substitution of a No. 2 hook for the usual needle in the worm. I am, however, far from commending the process, believing that it partakes of the nature of poaching, seeing that your quarry is lying more or less asleep in the mud, with his nose just below the surface. The experienced eye detects the slight indentation, the baited hook is put close to the fish's nose, he sucks it in, and a slight jerk hooks him; then he is drawn ashore with hardly any struggle—in fact, the fish was awakened only to be caught.

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CHAPTER XI.

THE GUDGEON.

THE gudgeon (*Gobio fluviatilis*) belongs strictly to a sub-genus of the Cyprinidæ family, and differs from the barbel chiefly by reason of the absence of the bony spine to be found in the dorsal fin of the latter. The full characteristics are as follow: Body elongated in shape, very nearly resembling that of the barbel; length of head as 1 to 5 in proportion to total length of body; depth of body less than length of head; upper jaw longest, as in all fish taking their food from the bottom. Soft, toothless, leathery mouth. Throat-teeth in two rows on each side, numbering three and five each, sometimes varying, however; shape of teeth, tapering and curved at tips; scales not large; one barb at each side of mouth; deeply forked tail fin, double air bladder. Colour: upper part of head, back, and sides generally olive brown, spotted with black, sometimes much lighter, however, according to season and soil; belly white; pectoral, ventral, and anal fins nearly white, tinged with brown; back fin and tail mottled brown. The fins' rays are almost invariably as follows: Dorsal 9, pectoral 15, anal 7, ventral 8, caudal 19. The gudgeon spawn in April or May amongst stones and other comparatively clean *débris* in shallow water. I have never caught a gudgeon above 10in. in length. The one I took of that size was from the Colne. Pennant, however, speaks of one which was taken near Uxbridge weighing a pound. It is said, but with what degree of truth I am unable to state, that male gudgeon are outnumbered to the extent of six to one by the weaker sex. The fish is very prolific. The food of the gudgeon is various, and is obtained from amongst the stones and gravel on which it is continually found hovering. Fresh-water crustaceans and other animalculæ are the chief sustenance of the little fish, and the bloodworm is caviare both as a bait and ordinary every-day food when obtainable. Gudgeon, when kept in an aquarium, should be fed on these

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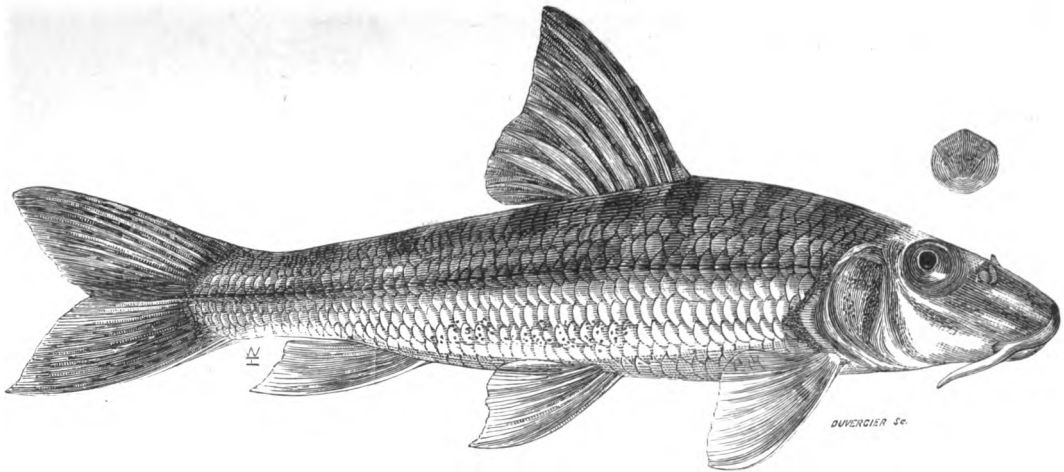

THE GUDGEON—(*Gobio fluviatilis*).

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bloodworms, they being an exceedingly favourite article of diet, and not at all likely to soil the water, it being their native element. Gudgeon are gregarious, and are in many parts of the rivers of England so plentiful as to obscure the ground whereon they lie. They seem to thrive best in the Trent, the Hampshire Avon, and the Thames. It is an error into which Mr. Pennell falls in supposing that gudgeon will not thrive in still water; on the contrary, I have known them to attain a size in still water much beyond that of the ordinary run of Thames fish. Their development in still water seems slightly different to that in a stream, the body becoming abbreviated, and the movements less rapid and vivacious. This alteration seems, however, to be peculiar to all stream fish introduced into still water.

Our little friend *gobio* seems to have been a well-considered fish from very early times. Ovid mentions him and remarks on his slipperiness:

Lubricus et spinâ nocuus non gobrus ullâ.

Ausonius also has a word for him, and in the translation of the Latin ode to Walton is the passage:

The little gudgeon's thoughtless haste
Yields a brief but sweet repast.

A piscatory poet, writing about 150 years ago, also refers to his eager haste to shuffle off the mortal coil:

Few lessons will the angler's use supply
Where he's so ready of himself to die.

Referring to this quality of the gudgeon, which, by the way, must be taken *cum grano salis*, Shakespeare uses the phrase through one of his characters of "fool gudgeon," whence probably Sir Walter Scott's expression in connection with a person "gudgeoned" out of opportunities given him. Hence the word became a verb, and Swift defines a human gudgeon as a person easily ensnared. But Hood, in his "Angler's Lament," seems to take a different view of the ravenous disposition of the fish. Thus:

At a brandling once gudgeons would gape,
But they seem to have altered their forms now.
Have they taken advice of the Council of Nice,
And rejected the Diet of Worms now?

Gay, however, reverts to the Shakespearean opinion that the gudgeon is a "fool." He says:

What *gudgeons* are we men,
Every woman's easy prey!
Though we've felt the hook, again
We bite, and they betray.

And Dr. Badham says, "A gudgeon is as incapable of refusing a young brandling when it falls in his way as a lion a succulent kid."

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Gastronomically, the gudgeon is a delicate and delicious little fish. What is it Pope says?

> Although no turbots dignify rich boards,
> Are *gudgeons*, flounders—what the Thames affords.

And the learned Mr. Manley opines that "it was probably to enjoy our fresh-water goby—*Gobio fluviatilis*—our esteemed gudgeon, and not his sea-water congener, that Ptolemy invited over to Egypt the parasite Archephon from Attica. The story, as told by Dr. Badham, is that this *bon vivant* accepted the invitation; but when offered at supper a dish of these delicacies, let it pass without taking any. Ptolemy, utterly taken aback by this strange conduct, first stared, and then muttered to his confidant that he must have invited to his table either a blind man or a lunatic. Whereupon Alcanor good-naturedly put the guest's abstinence in a new and more favourable light, by attributing it entirely to modesty. 'He saw it, sire, but deemed himself unworthy to lay profane hands upon so divine a little fish.'"

Anyway, *Gobio fluviatilis*, if cooked as the Thames-side fishermen's wives know how to cook him, is not at all a despicable fish. Better than smelts, I think, if fried and served hot from the river as it were. They ought not to be actually dead when tossed into the pan, and indeed I know of no more enjoyable meal than a dish of gudgeons, just caught from the river, cooked and eaten in the umbrageous shade of some old chestnut by its side.

Just a wrinkle as to cleaning them. After scaling with two strokes of a stiff knife, cut *across* the belly, not longitudinally, and with the thumbs of both hands exude the viscera. This is the Thames fisherman's way, and ten dozen gudgeon may thus be cleaned while one, metaphorically speaking, is saying Jack Robinson.

Let us turn back to the quotation from Dr. Badham. This author, presumably an angler from his learned and enthusiastic "Tattle" on fish, ought to have known better than to have made the assertion therein contained. The gudgeon is not so greedy a feeder as is believed. On the contrary, he is often very capricious, and I have known the gudgeon to feed ravenously for some days, and on the next to utterly refuse the bait. A brandling is also, by the by, by no means the best bait. A tiny cockspur is much better, and when the little fish are "on," which they generally are, with the reservation referred to, between June and the first frosts of November, fifteen and twenty dozen are not an excessive total of a day's sport.

As to the *modus operandi* of gudgeon fishing, I cannot do better than introduce my remarks on it with an exquisitely correct poetic description

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by John Dennys (or "I. D."), a writer of the seventeenth century, who, in my opinion, yet stands amongst the highest of angler-poets. He writes:

Loe, in little boat whene one doth stand,
That to a willow bough the while is tied,
And with a pole doth stir and raise the sand,
Whereat the gentle streame doth softly glide;
And then with slender line and rod in hand,
The eager bite not long he doth abide.
Well loaded is his line, his hooke but small,
A good big cork to bear the stream with all.
His bait the least red worm that may be found,
And at the bottome it doth always lie;
Whereat the greedy gudgeon bites so sound,
That hooke and all he swalloweth by and by.
See how he strikes, and pulls them up as round,
As if new store the place did still supply;
And when the bit doth die or bad doth prove,
Then to another place he doth remove.

The appurtenances of the punt for gudgeon fishing, besides the rods and necessary creature comforts, includes an indispensable requisite, namely—the gudgeon rake. This is an ordinary heavy ash or spruce pole, to which is affixed a heavy rake. After fixing the punt crosswise securely, the fisherman proceeds to rake.

Considerable dexterity is necessary, and the disturbance of the ground should be *from* the angler. This should not be resorted to too frequently, or it defeats its own end by exhausting its attractiveness.

The operation of raking the ground is obviously to disturb the tiny worms and other food on which the little *gobio* feeds. The fact sufficiently declares the character of the tackle to be employed—viz., of the lightest. For my own part, I prefer hair for the "link," and a No. 10 hook. The worm should be *threaded*, not looped on, the hook, and the float of some size to carry a considerable quantity of shot, that the bait might the more readily sink at the commencement of the swim. The gudgeon being a bold biter when "on," the fisher may strike at once, and one need not be ashamed to acknowledge the sport the pigmy fish gives, for, size for size, there is no stronger fish that swims.

When gudgeon fishing on the Thames it is as well to have a perch-jack paternoster on board. By this I mean a paternoster fitted up as described for perch, except that one hook of the two should be whipped on stout gimp, and be itself large. On the appearance of a slackening of sport, or possibly a sudden cessation, a small gudgeon may be impaled on the perch hook, and a large gudgeon or dace on the jack hook, for the cause is infallibly a perch or jack, attracted by the shoal of moving and excited gudgeon into active curiosity and desire. Having so done, fish all round in your gudgeon swim and on each side of the boat, and continue to do so for some time, for you may be certain that a marauding visitor is present. Many a good perch is also got *whilst* gudgeon fishing.

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I recollect once trying for a perch who had disturbed our gudgeon swim, and whom I afterwards captured (1lb. weight), when I suddenly found a slight tug, and on lifting up the bait discovered another gudgeon of somewhat large size caught by the lip by the hook on which my small bait was impaled. Mr. Pennell mentions a similar instance, which reminded me of the one I am relating. He fails, however, to account for such an occurrence, but I think I can help him. I have observed all fish, flesh, and fowl (except the human animal) to be cruel and bloodthirsty towards its puny or suffering young or fellows. There are hundreds of instances of this, and it is therefore sufficient to mention one. A turkey, if ailing and left with the rest of the flock, is soon worried to death. So in a curious degree is this the case with fish. Trout will worry a feeble member of their community till death mercifully relieves it from further persecution, and gudgeon will do the same. The explanation is therefore as follows: One of the swarm observing the enforced captivity of the bait and its evident suffering, attempted to attack it, and so got hooked. The same thing has occurred to me with roach, and I doubt not the same morbid feeling actuates the barbel when it takes the spinning bait.

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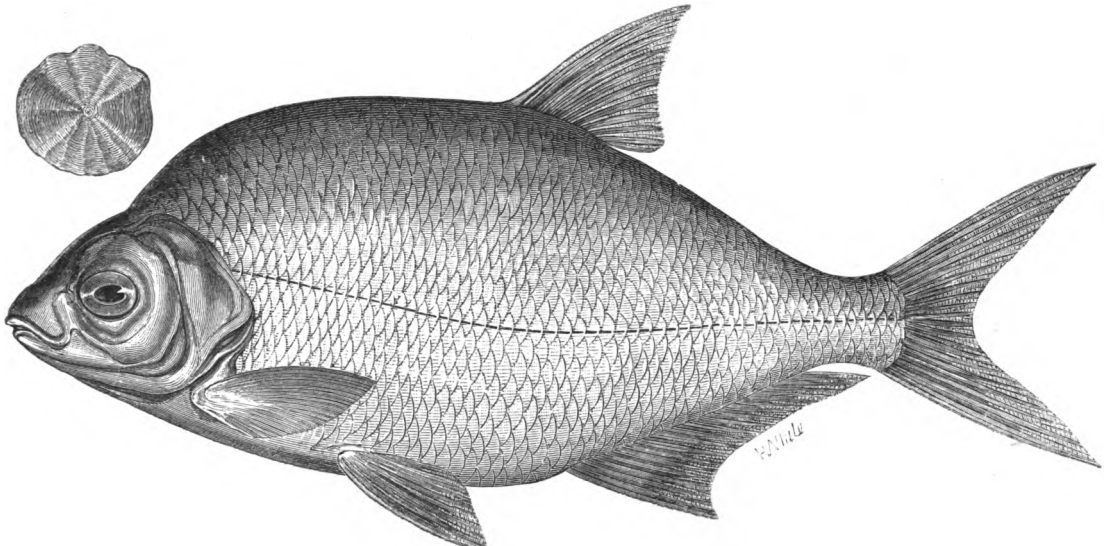

THE CARP BREAM—(*Abramis brama*).

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CHAPTER XII.

THE BREAM.

THERE are three species of breams known in European waters, and these have been scientifically named respectively, *Abramis brama* (the carp-bream), *Abramis blicca* (the white bream), and *Abramis Buggenhagii* (or Pomeranian bream).

The first of these is the most common in English waters, and, as its name would convey, it possesses certain characteristics of the carp, which characteristics, be it said, vary according to the depth and colour of the water from which the fish is taken. I know, for example, specimens of the carp-bream to come up in autumn flood time in colour far from resembling their antetype, rather, indeed, of a slaty grey hue than like the carp, "with scales bedropped with gold," and, on the other hand, I have taken them from the Thames of an almost bronze appearance. The same variation, however, appears in connection with all fishes, and is as unaccountable as it is curious. The white bream is a fish of silvery whiteness, and rarely exceeds a pound in weight. It is found in Dagenham Lake, and in some other waters in Cambridgeshire. I have taken one from the Thames, but believe that such a capture is exceedingly rare. The Pomeranian bream is a still rarer fish, and is chiefly found, as its name indicates, in Pomerania. It is said to have been taken from near Wolverhampton, and also from Dagenham Reach. It is much thicker in body, and the number of its throat teeth is different from that of the other species. A comparison of all these fish readily teaches the angler the difference between them.

As the average fisherman is very likely to meet with the two first-named occasionally from the same water, and as these two fish are much more alike when small than the Pomeranian is to either, I will, before going from the subject, give one or two simple hints by which the tyro can distinguish the fish. First, the colour is quite different, the

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white bream being of a sheeny white *always*, more like a bleak in hue than any other fish; the carp-bream is always more or less *coloured*. Secondly, the throat teeth of the white bream are in two rows on each side, numbering two and five respectively. The carp-bream has only *one* row on each side, numbering five. Thirdly, comparison of scales will always decide. The carp-bream in proportion does not form nearly so large a scale as the bream-flat; indeed, it is not quite half as large, and its outline on one side generally slopes away at an acute angle.

The native countries of the ordinary bream seem to have been central Europe, as well as the north, Finland, and Scandinavia. It is a quiet, sluggish sort of creature, thriving also well in lakes.

Nillson says it is found in Sweden and northern Norway, where the *Isotes lacrusti* weed grows, and that as many as 40,000 have been taken at one haul. Truly, a miraculous draught of fishes! Both Ireland and the Principality afford them—the former at Lough Erne, Mackenn, Fermanagh, and Cavan, and the latter in nearly all the deep tarns and still rock pools. Leland quaintly says: "In Wales, not far from Breckenok, in Blin Senathin, which is in bredth a mile and two miles of length, and where as it is depest, thirteen fadom, it berith as the principall fisch a great numbre of Bremes, and they appeare in May in mighte sculles, so that sumtime they breke large nettes, and ons frayed appeareth not in the brym of the water that yere againe."

This movement here spoken of probably is a general migratory rush preliminary to spawning, somewhat similar to that of the roach or tench at about the same season. Chiefly, however, the spawning takes place in June or July—not May—amongst rushes and weeds, each female fish accompanied by three or four males. Like the roach, at this critical season a peculiar roughness is found on the scales, and the fish has the appearance of being afflicted with measles. As many as 137,000 eggs have been estimated in the ovarium of a single female; no wonder, therefore, that some parts of the river Thames, as, for example, at Chertsey and Walton, keep up an apparently unfailing supply of bream.

The bream grows rapidly in favourable water, and often attains a great size in such rivers, for instance, as the Ouse and the Oundle. Blakey asserts that it has been known to attain the enormous weight of 20lb. in the north of Europe, and Bailey, in his "Angler's Instructor," mentions one of 17lb. taken from the Trent. It is on reliable record that out of a lake in Sweden in 1749 there were taken at a single draught 5000 bream, weighing in the aggregate no less than 18,000lb., this, of course, bearing an average of 3lb. apiece, which, bearing in mind the immense number, 5000, is very remarkable.

In English rivers, however, such weights are generally unapproached

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I have, myself, nevertheless, caught many over 4lb., and one, captured in November, 1877, scaled 7lb., which, by the bye, lived no less than ten hours out of its native element. The tenacity of life, indeed, in the bream has been remarked on many occasions. Gesner observes that it may be transported to a great distance, if wrapped in snow, and a piece of bread, steeped in alcohol, be placed in its mouth. This latter treatment, it may be noted, has evidently been imitated from that to which the *genus homo* ordinarily subjects himself during long journeys amid snow or general surrounding discomfort.

The bream, or breme, has been both praised and abused. That fair angler-author, Dame Julyana Berners, the Prioress of St. Albans, says it is a "noble fysshe and a deynteous." Chaucer also refers to it as follows :—

> Full many a partrich had hee on mewe,
> And many a *brome* and many a luce in stewe.

It is certain it was esteemed, for Sir W. Drysdale, writing in 1419, says that at that date a single fish was worth twenty pence, but, when a labourer found one, only sixpence was paid. He also speaks of a certain large "breme" pie which was sent from Warwickshire to a distant part of Yorkshire at a cost of 16s., which included two men three days in catching the fish, and an amount expended for "flower and spices." Nillson also says that in Sweden it was the custom to forbid the ringing of the church bells during their swarming season, lest the sound should alarm them. On the other hand, nearly all modern authors stigmatise the bream as coarse, ugly, producing little sport, and unfit to eat. Hear the words of Blakey: "The bream is a great, flat, coarse, ugly fish, strong in the water, but utterly detestable on the table;" and, further, "it sometimes attains a large size; it is then very much like a pair of bellows in shape, and much the same in flavour." How Mr. Robert Blakey knew what a "bellows" tasted like I cannot say, unless, indeed, he had tried it.

Gastronomically I consider this fish of some little worth, and I have known it to be by no means despisable when filleted and fried in oil. Old Walton quotes a French proverb to the effect that "He who hath breams in his pond can make his friends welcome." However this be, the fish is not unfit for food; on the contrary, I am glad to say that a recipe of Mr. Greville Fennell, given in the *Standard* some time ago, has rendered bream to me very toothsome, more so, indeed, than I had anticipated. This is what that learned ichthyophagist says :—"Of these fish (bream) English waters know two sorts—the golden and the silver. The former is a highly-prized fish on the Trent and some other rivers as being equal in parts to the John Dory, and requires little previous

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preparation for the pan; the other is, certainly, a fish when first caught unfit for culinary use, but the following simple recipe will make it so. Lay a stratum of clean pebbles at the bottom of an earthenware pan, then a layer of fish, sprinkle well with salt, then another layer of pebbles and salt until all the fish are thus arranged. Leave them a night to purify, and the objectionable matter will be found to have filtered to the bottom of the pan, and the fish are thoroughly purified and may fairly vie with flounders in succulence and flavour. Many then dry them in the open air for after use." I have also dried the fish as here suggested, and find them excellent, as is also barbel treated in a like manner. There is, however, a volume to be written on fish cooking; and I am not, I need hardly remark, the one capable of doing it.

In angling for this fish considerable skill is required for success. Like the head of his family—the carp—he is wary and peculiar in his way of biting and fighting. He is not easily deceived by artificial baits, although a natural fly is often, during the heat of summer and in early morning, caviare to him. He is as often taken in still water as in a gentle stream. Therefore it will be advisable to divide my description of tackle into two heads, one being applicable to stream and the other to lake fishing.

First, then, stream fishing. Use the Nottingham running tackle or leger, baiting previously as for barbel, and using as hook bait the tail of a scoured dew worm.

Here I may parenthetically describe the *habitat* and appearance of the various worms, especially as the bream disdains no kind of earth worm whatsoever. The dew worm, or maiden lob, is chiefly found on very dewy mornings or after warm showers, and is distinguished from the lob worm proper by not usually being so large, and lacking the light-coloured band which marks the position of the generative organs in the lob. I regard the dew worm as sexless, not immature only; but am open to correction on this point. The blue head, or marsh worm, is a worm of very handsome appearance, found under old damp sods and in marshy and peaty places. Its head, as the name signifies, is blue—not a common indigo or ultramarine, but an indescribable steely, glistening colour, occasionally at night time giving out a phosphorescent glow. The cock-spur is the small crimson worm, to be found in any well-decayed manure heap, with a yellow tip to the tail. The brandling is well known, and is a very pretty worm, possessing an ineffably disgusting smell, but of great vitality on the hook.

Either of these may be used in streams as a hook bait, and, according as the humour of the fish may incline to one or the other, so commensurately will sport ensue. The bottom gut should be very fine, but need

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not be so fine as that used in lake fishing. The weights plumbing the float should be few and far between, and not near the hook. The hook I use is a No. 6, needle eye, stout shanked, Redditch make. It is not whipped on the gut, but the latter, after being thoroughly softened by soaking in hot water, is passed through the eye of the hook, a knot made in its end, and attached to the shank by means of two half hitches drawn tight. And now a word about the travelling float. Let it be a very light cork one, of about eight inches in length, marked with coloured lines on its upper part, for this reason: the bream is a shy-biting fish, and usually, in common with nearly all flat fish, it takes the bait standing almost, as it were, on its head. After taking the bait it rises, but before it has risen in the water high enough (if the shots are far enough away from the hook) to feel the weight it has succeeded in nearly swallowing the bait. As soon as it feels the weight of the lead it invariably commences to eject the bait, and the float at the same instant, of course, rises and reveals a previously hidden bar of colour. Strike on the instant, not strongly, but with a wrist motion, sharply, and before your fish has had time to blow the bait out he is fighting for life and liberty with the steel through his upper lip. Always, also, fish with the same line, rod, and float, if possible, for these fish. You will find the eye and apprehensive faculties form, by thoroughly accustoming them to one sort of tackle, a sort of mental index of what is going on below, out of the minutest motion of the line or float, which may be acted on with the greatest nicety. On the other hand, if the tackle is constantly being varied, this mechanical precision cannot be attained or maintained. And this precision is absolutely necessary in fishing for bream if the angler would take "fysshe."

Of course, much of what has been said about stream fishing applies to angling in still water for these fish. The difference consists principally in the necessity for an extremity of delicacy of tackle, which, of course, would be injudicious amongst the varied exigencies of a stream. In still water a piece of quill an inch long is amply sufficient float, and one shot is enough weight to cock it. The hook gut and the succeeding four or five lengths should be made from the ends of the gut usually tied up in webbing when purchased in the hank, improperly deemed useless, from which I have made some of the finest and best lines for roach and bream fishing. It should be soaked thoroughly and straightened between the thumb and finger until it is quite clear. The most desirable sort of rod is a light, long bamboo. As to baits, for lake bream fishing worms, slugs, leeches, gentles, meal worms, and paste are all available. For ground bait, any of those recommended for roach or carp are good for bream. Greaves are both good ground bait and hook bait, and a

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favourite plan with some anglers is to inclose the hooks in a lump of greaves and clay, leaving it on the bottom until some bream more fortunate than the rest secures the hook and finds the "biter bit."

Some anglers prefer legering for bream as for barbel. When this style of tackle is used, it is advisable also to employ the lightest tackle consistent with the strength of stream or depth of water in which one fishes. The form of leger tackle most advantageous is as follows: A yard length of gut, with a swivel in the middle, terminating in a piece of gimp to receive the leger—the lead soon wears gut through. The leger should be flat or round, according to whether you may be fishing in still or running water—flat for the former and round for the latter—and should be covered in wash leather. The reason for distinction in the shapes of the ledger is because in a stream it is sometimes advisable to alter the position of the bait, and when it is required to send it further down stream without drawing the whole up and casting out again, with the round lead it is easy to accomplish this; one has only to let a little line out so that it bags with the stream, and a sharp jerk sets the perforated bullet rolling down stream to the full extent of the loose line. The hook for legering in a stream is also susceptible of difference from that to be used in still water. The latter may be the ordinary kind recommended for float fishing; but, for legering in a sharp stream, a stiff bristle is whipped with the hook on to the gut in such a way that it extends towards the leger about a quarter of an inch beyond the shank of the hook. Fine wire is probably better than bristle.

The utility of this arrangement is obvious. When the dew or lob worm is threaded on the hook, it is sustained in its position by the bristles set thus barbwise, and the wash of the stream is totally insufficient to reveal the shank, which otherwise would be the case. The swivel in the midst of the gut trace is to allow the worm to spin or gyrate, which, by reason of its curved form on the hook, it will usually do in a moderate stream, and which movement is very attractive to not only bream, but perch, trout, and chub.

Another very clean and neat kind of tackle, for which I take the credit of adapting, is composed of two No. 10 hooks, whipped on about half an inch of gut apiece, and the gut in turn whipped on a fine casting line, so that the hooks fall within three-eighths of an inch apart. The bait is two lively brandlings properly toughened. These are so arranged on the hooks that the head of the first is downwards, and curls in with the tail of the other. One shot is placed on the gut about a foot up, and the whole can either be cast, as in fly fishing, or, by attaching the aforesaid swivel, may be spun against the stream. It is a most effective kind of arrangement when the bream shoal in the manner described

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in the quotation before given from Leland. It should then be cast as a fly.

As in fishing for roach, however, or any other shy-biting fish, it must be borne in mind that such specimens of tackle as I have described, and such distinctions as I have drawn, are only useful in so far as they are used—not arbitrarily, but with judgment.

After all, the secret of good sport rests, not with the appliances of the angler, but with that intuitive sense of fitness, knowledge of the habits and circumstances of fish, and deft mechanical skill, which, if not attainable by all, at least may be partially acquired—so far acquired, indeed, as to render the gentle craft not simply a means of getting large and full creels, but a pleasant exercise of various powers in the angler as distinct from the joy of tabular results.

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CHAPTER XIII.

THE DACE.

THIS handsome white fish is the type of the *leucisci* family, which includes the chub, roach, rudd, azurine or blue roach, bleak, and minnow. Its similarity to the chub not unfrequently leads the tyro to confound the two, and I have several times had to correct even experienced anglers in this matter. The small fish of each kind are indeed so remarkably alike as to be quite indistinguishable, unless these simple facts are borne in mind—the ventral or belly fins of the dace are greenish, with a slight tinge of red; the anal has no red about it whatever; in the chub all these fins are of a brilliant pink colour.

Leuciscus vulgaris (the dace) abounds in nearly all the quiet clear streams in the south of England, in many of which no trout or salmon are to be found, as well as the large rivers of both England and Wales. The Thames and Colne are, however, the most famous for this fish. Teddington Weir is historically celebrated. The fish is in full season in October, November, December, and January, and many a good bag of fish may be taken in these months, when otherwise no sport is to be had.

The spawning season is in early summer, and the prolificacy of the fish is enormous. The ova are of a yellowish-white colour, and somewhat large in proportion to the size of the fish, being in a large dace as large as a mustard seed. I observe that the size and colour of the eggs vary somewhat in dace from different localities. The agility of the fish is very great, and protects it from its enemies very materially. Nevertheless, the pike has a great *penchant* for the dace, as I have before indicated.

Writers on fishing dismiss this handsome fish with but scant notice, a course manifestly unfair, when its game qualities are borne in mind. Its strength, size for size, is equal to that of the chub, and its cunning is but little inferior; whilst, personally, I am inclined to elevate its stamina

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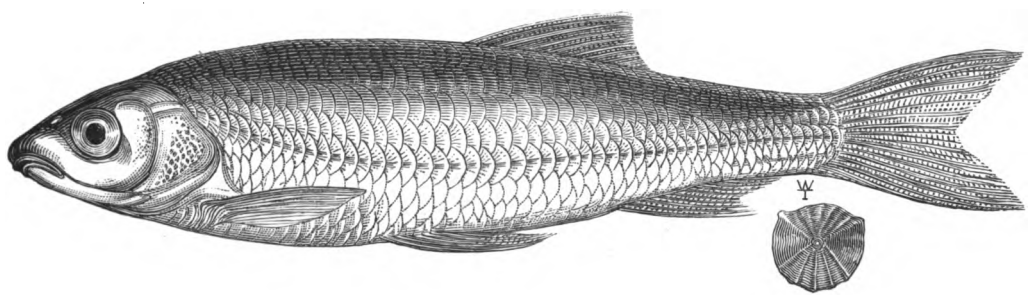

THE DACE—(*Leuciscus vulgaris*).

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and real courage, as distinct from mere dash and splash, above its broad-headed congener. The comparison, however, to a great extent, fails from the fact that but few dace attain the size at which *Leuciscus cephalus* (the chub) begins to develop its fighting powers. It is rare to find a dace over a pound in weight. I took one from the old Windsor water, which went 13oz., in the beginning of the year 1877, but the size is remarkably exceptional. It was taken, barbel fishing, with leger and lobworm. Dace do not seem to thrive in still water. The food of the dace, in its natural state, consists of nearly all water insects, whether crustacean or annelidan, and its marvellous quickness and precision enable it to seize its prey with instantaneous facility. I have been much amused, on more than one occasion, when watching a dace, by its movements in search or in anticipation of food. Like the chub, it will now and then secede from the general usages of its own fishy society, and solitarily hold watch and ward behind some shelving covert. Thence it occasionally, like a flash of green light, darts on its prey, and woe to the tiny water flea or ephemeral fly within reach or sight. And again, I have been interested in the patient aspect of a dace, evidently waiting the emergence of the stonefly from its barky covering, or the cad bait from its beautiful house of coloured pebbles and tiny fresh-water molluscs.

The name dace has not a very traceable origin. It is sometimes also termed the dare. Thus Michael Drayton—

> The pretty slender dare, of many called the dace.

It is termed *daas* in Dutch, *dard* in French, and *darden* in Welsh. In some parts of England it is also termed the *dart*, probably in reference to the swift speedy motion of the fish. Drayton says:—

> Of swiftly as he swims his silver belly shows,
> But with such nimble flight ere ye can disclose
> His shape, out of your sight like lightning he is shot.

At any rate, whatever the origin of its name, it is a miniature salmon in symmetry and sporting power.

The appropriate transition from the food of a fish is to its capture; and, although in the generality of cases it is impossible to closely follow the natural food of a fish, yet in regard to the specimen before us it is quite easy to catch it with its own regular diet. Fly fishing with the artificial fly in the shallows in late summer is a very fascinating method of capture, and has the merit of requiring considerable skill for its successful practice. The hand must respond instantaneously to the eye in striking on a rise, for the dace, as I have before said, seizes its food

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with ravenous avidity, and, being a rapid feeder, requires, therefore, rapid hooking.

Perhaps, however, the most artistic kind of angling for dace is with the Nottingham tackle, using a worm for bait. Wells, of Nottingham, the well-known tackle maker, sends out a magnificent dace rod at an absurdly small price; and with it and the tackle he furnishes, made specially for dace, *i.e.*, finest twist line, a tiny quill float, and gut bottom of beautiful silk-worm gut, dace fishing becomes a science to be pursued with a maximum of numbers and sport. With this tackle the bait I use is, in early season, the cad bait; in late season—especially in flood time, when, like barbel, these fish frequent the sides of the river and rejoice in the submerged green turf—the tail of a lobworm, or, better still, of the dew worm. A red worm is also occasionally very effectual, but commend me to the opaline tail of a well-scoured dew worm. I cannot understand a dace ever refusing this bait. The cad bait is, of course, a *confrère* of the caddis bait, and equally, of course, a close relative of the straw bait, or *porte bois* of the French angler. It is, no doubt, the stock bait of the dace fisherman, although flies or gentles are good lures.

Next to the Nottingham, I prefer the blow line style. I know of no more enjoyable method, indeed, in the soft evenings of summer, when the dace do not lie in deep water, but approach the shallows to feed. There is also the chance of additional sport in the Thames from a trout on the fine tackle; not large, perhaps, but game. The rod had better be from 12ft. to 16ft. in length, and the line of soft silk twist or cotton, the bait an artificial or a natural blowfly. A stonefly, with its bunch of ova exuding from the body, artificial black gnat, the hook tipped with a gentle, are famous baits. It is needless to say the wind must be consulted more carefully with reference to this tackle than with any other.

Well do I recollect my first lesson in this style and with somewhat more than ordinary regret do I remember my instructor. He was an old gentleman who had passed his life in active business, and in the autumn of his days had settled at Chertsey Bridge, with but one aged servant, to enjoy the remainder of his life in fishing and communion with Nature—and a profound angler and naturalist he was. Some of my readers will remember him as they passed the Domesday deeps or the shallows of the Chertsey meads, sitting in the golden eventide, calmly smoking the calumet of peace (he was a great smoker) and watching with imperturbable calmness the tiny float, or strolling leisurely, rod in hand, homewards when the night shadows had gathered on the distant Woburn Hill and the evening star had peered out over the Shepperton Range. This gentleman took me in hand, and showed me the making of a fly and

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numberless other "wrinkles," by which I have since profited, amongst them the wonderful effectiveness of the blow-line when properly used. When my first essay with it was made—I, a boy of ten—I recollect the thrill of the struggling dace, like an electric current, which permeated my embryo angler soul. And that night my Telemachus hooked a trout with the very tackle with which I caught my dace! I have known him catch four and five dozen dace in an evening, using the blow-line.

I cannot forbear this tribute to the memory of my teacher, and I trust the general reader will forgive me—the reader who recognises the original will, I know. Poor old gentleman! he died of a terrible disease—cancer—ill in accordance with his peaceful pursuits.

I do not know that it is of any use to ground bait for dace. Perhaps, when bottom fishing, however, it is as well to throw in a few broken worms which have been rolled in silver sand, and brewer's grains will have an attractive influence on the fish occasionally. The dace is a mid-water fish to all intents and purposes, and as such must be treated. The chief thing is to know where to find him. Ground bait is, therefore, only questionably useful.

One word as to his gastronomical *locus standi*. The Jews esteem him, so much so, indeed, as to give as much as £1 a hundred on special occasions. For my own part, cooked like smelts, I think they are by no means to be despised for the breakfast table.

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CHAPTER XIV.

THE ROACH.

WHO does not know this beautiful member of the carp family, and who is there amongst the angling brotherhood who has not derived sport from his capture? *Leuciscus rutilus*, the roach, is plentiful, game, not bad eating, and may be caught in a vast variety of ways—hence his popularity. Next to the "game" fishes, there is probably no other species which affords so much sport to so great a number of anglers in our fresh waters, nor is there one evoking so much ingenuity and mechanical skill in its capture. I have said the roach is plentiful. There is no need of proving this assertion. Every stream in England, and nearly every lake, afford them in great quantities, notwithstanding inveterate enemies of nearly every nationality—flesh, fowl, and fish. If, however, their plenitude is noticeable in this country, what will be said of the statement of Bloch, the German ichthyologist, that before the *marias* on the Oder were drained such enormous quantities were frequently caught that they supplied amongst the adjoining villages sufficient provender on which to fatten pigs. In various other countries in the North of Europe also it was common to manure the land with them. That it is a "game" fish is also indisputable. A pound roach is no mean antagonist in a strong stream and on fine hair or gut tackle, notwithstanding the opprobrious epithet bestowed on him by Walton of "water-sheep," and the dictum of Dame Julyana Berners, that "The roche is an easy fysshe to take;" howbeit, her prioress-ship confirms the statement that he is fair eating by adding to the foregoing, "Yf he be fatte and pennyd thenne is he good meete."

A description of this handsome fish is not easy, and it varies so much in its tints with the season, depth and quality of water from which it has been taken, that I have thought it better to have it represented by a pen and ink sketch (which has been ably done by my friend, Mr. Percy

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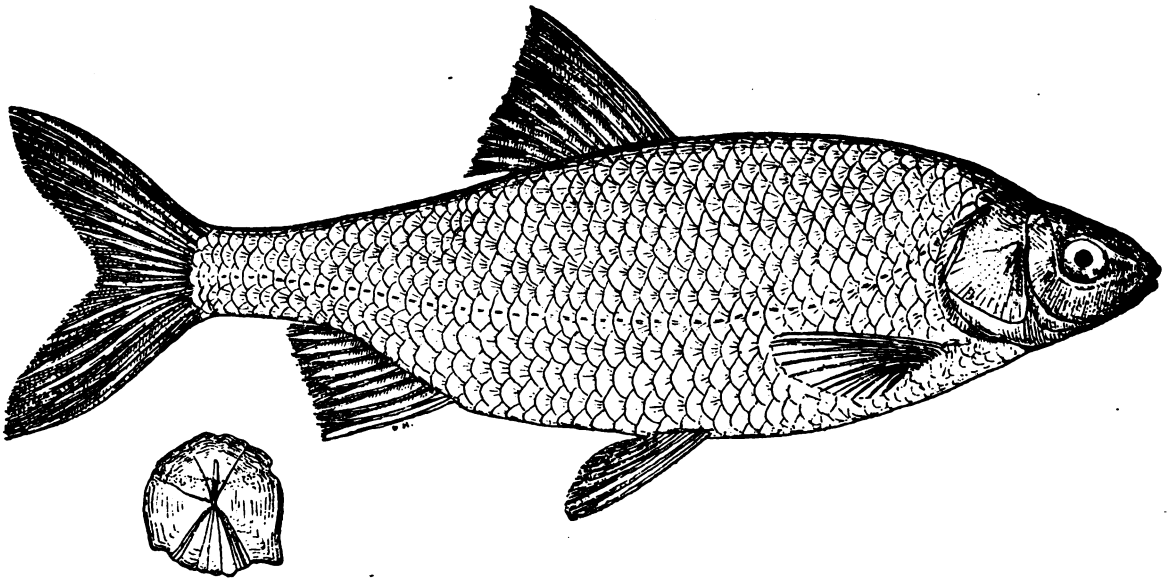

THE ROACH—(*Leuciscus rutilus*).

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Highley), in preference to a shaded engraving indicating colour. If the reader will fill in on the accompanying cut the description of Yarrell, he will have the fish well before him. "The colour," says the author, "of the upper part of the head and back is dusky (often bright) green, with blue reflections, becoming lighter on the sides, and passing into silvery white on the belly; the irides yellow, cheeks and gill covers silvery white, dorsal and caudal fins pale brown, tinged with red; pectoral fins orange red, ventrals and anal bright red." The scales are rather large and marked with consecutive and radiating lines (as shown in the small drawing).

Leuciscus rutilus is gregarious, and not only does he seek the company of his own species, but may be often found promiscuously mixed up with a shoal of barbel, especially if the latter be small. The most compact swarms of this fish, however, are to be met with in the winter during mild days, when they may be said to be in the most perfect condition. The spawning season is usually about June, and it takes quite six weeks for them to regain condition. They spawn in the weeds flanking the shore, and the ova are very numerous. As many as 125,000 eggs have been counted in the ovarium of a ¾lb. fish. Like carp, they are at this season subject to fatal disorders. I have more than once witnessed roach die from retention of the ova, brought about by the weakening agency of the tapeworm (*Ligula digramma*) or the ravages of some other equally dangerous internal parasite. In lakes in which these fish abound it is usual to find these fish in the season of spawning crowding and jostling each other at the very edge of the water, as if desirous of getting on the dry land. They may then be taken very easily. Herons and other fish eating birds make a great harvest at this period.

Apropos of this branch of the subject, I recall a rather interesting episode which occurred whilst I was attentively watching the jostling and crowding above referred to of the spawning fish, and which may be of interest to my readers, although somewhat aside from the subject. I had been watching the fish in countless numbers crowding the margin of the lake, when my attention was directed from them by the cautious and circumspect movements of an old stalwart grey-bearded rat of enormous size. This gentleman was also carefully watching the roach with glistening eyes, and slowly approaching by side-long movements the edge of the water. Some sticks and stones and various *débris* lay strewn about, and amongst this the rodent moved, hiding himself as he approached. I remained perfectly still. At last, with a sudden splash, as quick as thought, he had dashed in the water, and was again on the bank, with a roach of about seven inches long in his mouth. The movement was so quick that the shoal seemed

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in no wise disturbed. Mr. Rat was no sooner on land than he despatched the fish with several vicious bites, and disappeared beneath an old disused "britain" board, which, as it stood slightly on edge, afforded some sort of capacious covert.

At this moment a kingfisher, as apparently oblivious of my presence as the rat had been, like a flash of azure light darted into the water quite close to the scene of the former's proceedings, and as instantly as the rat again appeared with a roach quite as big as itself, and, after hovering a few moments with its burden, settled on a piece of wood lying in the immediate neighbourhood of the rat's quarters.

I was greatly amused at the little bird's method of killing its prey. By a series of tiny movements it shifted the hold of its bill from where it had been near the head of the fish to the region of the anal fin, and then, with vigorous skill, began to batter the head of the roach against the wood on which it was perched. In the meantime his ratship had not been idle, and at this juncture I could perceive his villainous glistening eyes fixed on the beautiful bird and its prey, himself not more than three inches distant. For some seconds he watched the process of execution as the movements of the struggling fish became fainter and fainter. When they totally ceased, with a sort of swift bound he was upon the kingfisher; it dropped the fish and sped away in fright, leaving Mr. Rat master of the situation. He immediately, with business-like celerity, also disappeared as before, carrying his ill-gotten gains with him.

Wishing to see if he actually ate the roach, I approached his hiding place, and, on lifting up the board, counted no less than ninety-five roach, almost all whole, with the exception of their eyes, which had been picked out of the sockets by this voracious creature.

At the spawning time roach are exceedingly delicate, and die almost immediately when taken out of the water. On several occasions I have been astonished to find them on being handled at this period suddenly become rigid from head to tail, as if seized with a species of *rigor mortis*. They may be broken in half when in this state, but not bent to any appreciable extent. After death proper they become somewhat more flexible.

I am disposed to think that the sexes of these fish, in rivers especially, when spawning, proceed apart in shoals for the consummation of the process. Thus the females first, in an extensive swarm probably, and the males following after the females have shed their ova for its impregnation. I have observed also that the males only assume the cataleptic condition above referred to. After the debilitating conditions of the spawning season, possibly as a recuperative means, the roach seek the silk-weed, or *Conferva rivualis*, of which they at nearly all seasons

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seem somewhat fond. Particularly do they affect it at the period referred to. I have taken large quantities of roach with it at the weirs on the Thames during early season.

The size which roach attain is debateable. Occasionally we get an authenticated account of one from the Thames of 2lb. weight, but seldom over that, and the reports of takes of big roach reaching this weight, and of number legion, which arise from the hazy atmosphere of exaggeration surrounding Thames fishermen from time to time, may be looked upon, if not with disbelief, certainly with suspicion. A friend of mine, who is eighty years of age, and has been a bottom fisher for sixty-five years, strengthens me in the opinion that in England a 2lb. roach is a rarity. He assures me he has never taken more than five such fish throughout his long experience. In some northern continental rivers, however, this size, we are told, is more common. The probable limit of the age of the roach is about thirty years. The haunts of the roach vary with the season and size of the fish. During the high temperature of midsummer he is chiefly to be found contiguous to the leafy shade of water lilies and other broad-leaved weeds, and can be drawn forth by judicious ground baiting to any "swim" within sight. Roach are, then, of all sizes in their communities, and, whilst your friend is landing a pound fish, you, in the same punt, may be playing a feeble "sprat"-like individual. As the season wears on, however, the natural domestic instincts return, and the very large fish seek the deep still holes where abound barbel, large perch, large dace, large chub, and, perchance trout—thence only to be drawn by the invitations of a *cuisine* on which large fish of every species of the *Cyprinidæ* at least seem, with but trifling exceptions, to agree. But of this more farther on.

As winter approaches and the equinoctials blow, the land floods rise, transforming all covert but that in the deeps; then it is that the roach *en masse* here and there occupy dainty corners and selected nooks. The roach fisherman knows how to take advantage of the altered circumstances of his quarry, and frequently from such spots the whole shoal may, as in the case of perch, be drawn.

The food of the roach is chiefly composed of water insects. A microscopical examination of the contents of the stomachs of some hundreds of roach at various seasons has convinced me that the whole group of the *Crustacea* forms the principal means of subsistence; whilst as far as I know, unlike any other fish, they persistently search after and consume not only some of the higher order of vegetation, such as the *Conferva rivualis*, but the lowest, such as the *Hydra vulgaris* and *Volvox globator*, if, indeed, either of these or both is animal or vegetable. Of course, in this description of their food I refer to roach in a

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natural state. All kinds of larvæ and worms are also their natural food.

There is another species of roach which is but very little known in England, but which has been described by Yarrell, termed *Leuciscus dobula*, or the Dobule roach. In continental waters it is fairly plentiful, and I am indebted to a friend for having afforded me a sight of this interesting fish. Its general appearance is that of a roach of considerably increased length than *Leuciscus rutilus*. The chief differences are, beside this, in its very forked tail and smaller scales. Instead of forty-three of these, or thereabouts, it possesses fifty, and, I am informed even more occasionally. The colour is somewhat similar on the back to our roach, but with more of the bluish tinge; its sides are quite silvery, more like a dace, and its fins are of a pronounced orange redness. An old angler—a friend, whose name I am forbidden to use, and to whom I have referred before as being over eighty years of age—reports catching a brace some few years ago in the brackish water of the Thames' mouth, and, in addition, tells me that the description I have above written is, as far as his memory serves him, correct. The chief difference *he* asserts to be the extremely dace-like length of the fish in question, and its further suggestiveness of dace about the head. I am exceedingly sorry I cannot secure one for illustration, and should be very much obliged to anyone forwarding a specimen for the purpose. The Weser, I am informed, as well as the Oder, Elbe, and Rhine, produces the fish in considerable quantities. It is termed the Dobule in Germany. The other personal characteristics of this roach seem, from all I can gather at present, to be as nearly as possible identical with that of our well-known fish. It takes the same baits, seems to be almost as gregarious, and its gastronomic value is equal. Further than the foregoing it is not necessary to advert to this fish, for the English average angler is not likely to often meet with it, being so rare.

My next task is to refer in a general way to the methods of capture to be used for the acquisition of the roach, *sui generis*. I shall hereafter refer to the minutiæ of tackle necessary, but for the nonce will give my ideas generally on this distinctive style of fishing. Even Walton awards London anglers the preference as to skill in roach fishing. As I have somewhere before pointed out, there are several styles which may be characterised as representative styles of fishing. I should, indeed, say, following out this fancy, that the roach and chub fisher belongs to the *Quietist* order, the jack, trout, and salmon fisher, the *Vigorous*, and the gudgeon fisher the *Dolce far niente* class. Anyhow, the London roach fisher, passing to his beloved Thames or Lea, makes a speciality of the roach. Patiently does he sit hour after hour calmly regarding the

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unregarding stream and float, and verily he has his reward. The bright sun showers down its plenteous beneficent warmth and light, the six previous days' toil is forgotten, for perchance it is Sunday, and the birds are carolling their high songs, not in temples made with hands, but beneath the expansive vault of infinite space—the temple of nature; the stream flows on with fluent music and the perfect harmony of green fields, umbrageous trees, and cloudless skies is appreciated by the innocent fisher as he sits quietly watching and manipulating. Small wonder, therefore, that the placid spirit of Walton recognised the actual fact of the specialist roach fisher's superiority. That the Londoner (or Cockney) should be selected is only natural, for is he not, by right of high-pressure toil through six days, a Sunday fisher, and is not the quiet of an angling rest the time to accept Nature's gifts and to learn of her beautiful creations and their characteristics?

But to resume. Plunging into the midst of this branch of the subject, I may be first allowed to make a selection of a suitable rod. In my opinion there is no rod superior to a well-made ordinary Japanese cane "telescope" rod, that is, for ordinary still bank fishing. "Why?" it may be queried. "Because" of the following reasons, gentle reader. The ideal of a roach hole accessible from the bank, and not only the ideal but the general character of all the successful swims of the bank angler is as follows: Chiefly gentle running water, considerable depth, weeds beyond, or a rapid stream, as well, probably, as such inconveniences as sunk stumps, roots or boughs, from which it is desirable to restrain the fish when hooked.

Take up a Japanese "telescope," therefore, and observe the fulfilment of the requirements indicated. You have a rod, when extended, of almost perfectly symmetrical build. It is light—very light; it is sufficiently pliant, yet, in proportion to its length (of, say, from fourteen to twenty feet), it is a stiff rod, and is nearly perfect for retaining your fish when hooked from entering the "inconveniences" surrounding the scene of action. Also, after your roach is "played" to exhaustion, the form of the rod, from the availability of its collapse joint by joint, allows of the landing of the fish without the necessity of rising from your seat and receding from the water, to the detriment of the sport, which is incontestibly the case with the ordinary rigid rod. From its perfect fit of joint in joint its extended form is easily restored. Lastly, it has another important advantage. Owing to its comparative stiffness without weight, the power of striking with instant effect is greatly increased; but this will require some explanation. Sometimes roach are so shy in biting that the float only descends some eighth of an inch as the fish takes the bait. In this case, however, the skilful roach fisher, being all attention, strikes,

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and, if his rod be sufficiently stiff, he invariably hooks the fish, but, if too pliant, the upward movement of the wrist in striking is not instantly communicated to the top of the rod because of, as it were, the wave of vibration mechanically affecting the tapered wood so slowly as to require some parts of a second to traverse to the top; and in such case, of course, the bait is blown out ere its movement takes place. In the case of the stiff rod the movement of the top is simultaneous with that of the butt in the angler's hand.

This description of rod, it must be borne in mind, is only applicable to roach fishing proper, or tight line angling, and of course is not suitably for general purposes. There are spots on the Lea where roach are invariable only caught, and where, from the spots being constantly fished, only the expert roach fisher can expect to stand a chance. Of various other places the same may be said. Tight line fishing, therefore, gives the sport *par excellence* in such circumstances, and for such a purpose I have found the "telescope" rod to answer admirably. Allow me to inform anglers also that there is very much more "art" in landing a 2lb. barbel from your roach swim with a tight than with a running line. This, however, by the way.

When it is determined to use tackle allowing of a running line in preference to risking the alternative of Izaak Walton, on hooking an unmanageable fish—namely, of throwing the rod in the water—I may mention to intending roach fishers that Messrs. Carter and Son, of Islington, have brought out a capital portable and strangely light roach rod. This is 20ft. long, and only weighs 1¼lb. It is so arranged when not in use that the two bottom joints between them contain the rest. This butt is 4ft. 6in. long, and but 1¼in. in diameter in the largest part. I should say this is not a very saleable class of rod, but nevertheless is a capital sort for the exclusive roach fisher.

Another kind of tackle for open water, and which is often eminently successful, is the Nottingham running tackle. As my readers are doubtless aware, the motto of the famous Trent anglers is "fine and far off." The Nottingham roach rod is adapted necessarily for striking from long distances. The scope of this tackle is large, but is not, I conceive, specially suitable for the localities in which the best and most fish are to be found.

My idea of the winch—and to fish with a winch is the safest, if not the most sporting way—is that it should be small and as light as possible. Any additional weight to the butt of the well-made roach rod interferes with its balance; therefore the smallest, to hold the finest line, is most suitable. It should be of brass, and with no internal mechanism, such as cogs and wheels, for multiplying or checking its coiling power. These rust, being usually of steel, and get out of order, or if of brass or gun

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metal they soon wear out. In addition, they are difficult things to calculate on as to the tension on the line when unwinding, and so ofttimes one is led to over or under estimate the treatment of the struggling fish. As to line, I always use a fine plait silk, it being less liable to get out of order than a twisted line.

Now comes the question of gut *versus* hair, and although I am sensible of the differences of opinion existing on the subject, and the preponderance in favour of gut, yet I must record my dissent to this.

I am fully aware that gut is the stronger, may be got as fine, and is as apparently transparent; but hair is elastic and gut is not, hair is perfectly round and receives the water more readily than gut, and is consequently more transparent in the white kind. The brown hair (which is the strongest) assimilates more with the colour of the ground and seems to me to be less visible than gut of the same colour. The polish on the gut refracts the light considerably more than does horsehair. The principal thing in the favour of hair appears, however, to me to be its elasticity.

When fishing the bait should always lie either on the bottom or just off —just *off* when the fish are feeding boldly, and *on* when they are less forward. The float should be very light. I make my own of deal, highly polished, and usually so light that two shots, or, at the most, four, are sufficient to cock it; both ends are brought to a very fine point. By using such fine tackle roach may not be unfrequently caught when they bite so shyly as to scarcely move the float at all. What I have said as to using one set of tackle, in the chapter on bream, of course applies to roach.

The baits for roach—who shall name them?—artificial and natural, reasonable and absurd, they are legion. Each roach fisherman has his own particular compound in the way of paste, and his own fancy amongst the labrous annelidan family. Perhaps, indeed, there has never been such a variety of mixtures for any special disease as have been compounded by the roach angler for the benefit of his favourite fish. And, like nearly all nostrums for the cure of disease, each paste or unguent has been more or less successful according to the amount of faith by which its use has been accompanied. Some of these are to entice the fish by their odour, others to lure them on to their destruction by the sense of taste. Of the former a whole pharmacopœia of "fetids" has been brought into requisition. Myrrh in wine lees, aristolochias, assa-fœtida, and a hundred strong-smelling herbs, turpentine, and aniseed were all pressed into the service, as in a former chapter I showed. In pastes, also, every strong flavouring was used.

The best paste, however, is that which is formed of white bread, well and cleanly kneaded, as an old author remarks, "*that* being made of white bread and milk needeth *clean hands*." Gentles are, of course, the

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staple bait. Wasp grubs are a good autumn bait, and red worms are often a capital lure. As for ground bait, I know of none better than that advocated by Mr. Mechi, who is as good an angler as an agriculturist. In the *Field* of 18th August, 1877, he says: "When fishing with bread paste the best ground bait is a quantity of bread paste mixed with a large quantity of bran, formed into balls larger than marbles. If there is any current or stream, a small stone should be placed in them to sink them to the bottom." For gentle fishing I usually ground bait with bran the night beforehand, and simply when I fish throw in a few gentles from time to time. I am persuaded that it is very common to over ground bait and so satiate the fish you wish to take.

Apropos of gentles I may here give my experience in breeding and preserving them in winter, inasmuch as that they are a very useful, in fact, indispensable, bait for roach, especially in late winter, when, owing to frost, lob worms are not to be had. To breed and preserve gentles in winter: Materials, a cast iron pan to hold 6 gallons (an earthen pot would answer the same purpose), and a 2 gallon bottle with the bottom sawn off; these, placed in a cold out-of-the-way building, are all that is necessary, except the breeding stuff. Fill the large receptacle, to within 2in. of the top, with damp river sand or garden soil, and place the bottle (neck downwards) on the top of the soil in the larger vessel. From the middle of October to the latter end of November place offal in all the sheltered and sunny spots where the blow-fly resorts. When the offal is sufficiently blown, place it inside the bottle, and as it sinks down the bottle replace it by fresh offal. Never let the gentles starve; they will, however, find their way down into the soil beneath, and can be there taken up when wanted.

To prepare wasp grubs, also a splendidly killing bait in late summer: Pick the grubs out of the comb and put them into a colander inside a large basin; then pour a large saucepan of boiling water over them and stir with a spoon till, by the touch, they feel firm, then instantly drain and throw them into a little bran and shake them till quite dry (for on this success depends). They will be found very firm. If they are placed on a plate or slab, and kept very cool and coated with honey, they will keep well for weeks.

I have taken bream galore with this bait also. The following are also some good pastes, although, as before stated, I believe in white bread paste before anything else.

Honeycomb Paste.—Honeycomb mixed with flour and kneaded into a paste is very good for roach in November. The wax renders the paste very stiff.

Red Paste.—Take the crumb of a *new* loaf, well knead in the hand

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till it becomes tough, use as little water as possible; if the river is discoloured mix vermilion until it becomes of a bright red, something the colour of salmon roe. Or use anatto, which affords a very bright vermilion hue. The cochineal and lac insects yield, before they are exposed to the operation of acids, a rich crimson colour.

Streaky Paste should be made of the finest flour and sugar and water. Colour half of it with red lead, and when using mix them together so that the paste may have a streaky appearance.

White Paste.—Soak a piece of very stale bread for ten minutes, press the water thoroughly out, and knead with an equal quantity of new bread, either dry or dipped quickly into water and squeezed; the result is a soft, tough, and perfectly white paste. Again, the dough for bread previous to baking makes a good paste. An excellent paste may be made by dipping crumbs of bread in water, and kneading it in a towel till it becomes a thick paste. A little honey may be mixed with it.

Sometimes fly fishing is practicable, and exceedingly useful after the spawning exigencies have been disposed of in early summer. The flies that may be used are as follow:

The furnace hackle with peacock body; the black palmer, dotterel hackle, with dirty yellow silk body; a well-imitated green drake, the coch-y-bonddhu, or with a fly made of red hackle, and with a tough gentle put on the hook instead of any wrapping for the body of the fly; next, a small coch-y-bondhu, with a gilt tag at the end, and black gnat, they seem to like best. As roach seldom come to the top of the water, a good sized shot a few inches above the fly should be attached. In manipulating, look out for a shoal, as they keep incessantly swimming backwards and forwards, quietly throw over them, letting the fly sink; and, as it is being drawn up again, they generally take it. The hotter and brighter the weather the better the sport. The artificial fly—house or dung fly, black gnat, and red ant, &c.—if the hook be, moreover, armed with a live gentle, is a most killing lure for heavy roach. A natural fly, a common meat fly or house fly, is far more deadly than the artificial fly; with the natural baits the angler can scarcely use too small a hook, resorting to his blow-line as described for dace. If he come across a shoal of roach, he should always get behind it, and cast his flies in front. Some anglers whip with either a real or an indiarubber gentle.

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CHAPTER XV.

THE CHUB.

THE chub (*Leuciscus cephalus*—large-headed dace), or "loggerhead," as it is sometimes opprobriously termed, is a fine, handsome, silvery bluish carp, of prodigious strength and considerable cunning. There is but little justice in the term "loggerhead." It is evidently in reference to the breadth of the fish's head and its habit of endeavouring to hide itself, head first, in the weeds, when hooked, that the nickname is given. Really, however, the head of the fish is symmetrical, and the entire contour is indicative of strength. The term "loggerhead" is, therefore, a cognomen which, in its opprobrious sense, is undeserved. It is also termed skelly (scaley ?) in Scotland and the Cumberland lakes, and its old English name was *chevin* or chavender, which is even now preserved in some localities.

The chub abounds in nearly all the rivers of England and France, and, from its strength, is equally at home in rapid torrents and quiet smiling depths. It is rarely found in lakes, nor does it thrive in stagnant water. Its size often from the Thames is above 4lb., and in some cases chub of 6lb. have been scaled. Such occasions, however, are rare. In some continental rivers I am informed it is not unusual to find them as large as 10lb. What a splendid piece of sport would one of this size afford on fine Nottingham tackle in a deep open stream !

The spawning season for chub is soon after Easter, and the ova, which are each of a yellowish colour and about the size of a poppy seed, are deposited on the shallows somewhat after the fashion of roach, although in probably somewhat more secluded spots, near and under weeds. Like the roach, the parent fish, immediately after the operation, consume in large quantities the weed *Conferva rivualis*, which may or may not exert some beneficial influence on the health of the fish. In

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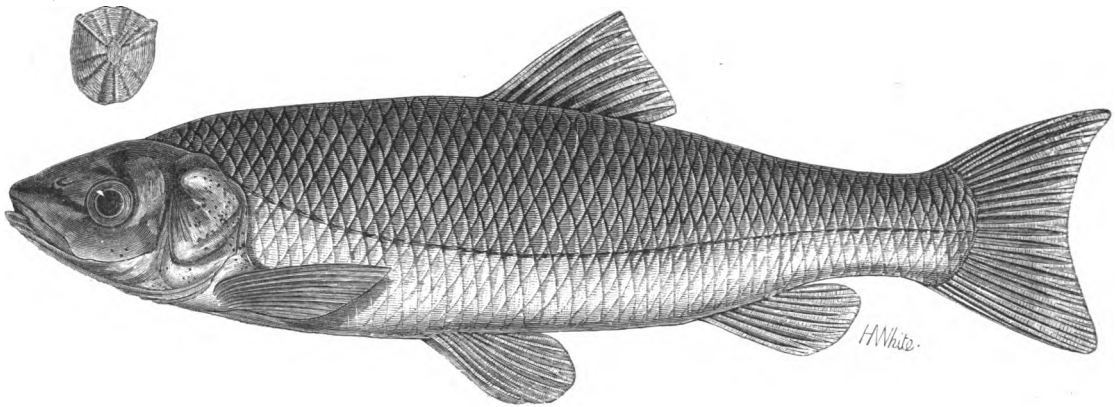

THE CHUB—(*Leuciscus cephalus*).

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this connection, it may be noted that these fish seem even more fond of the weed generally than the roach.

When chub are young there may in some cases be a difficulty in distinguishing them from small dace. As they increase in size, however, the difference becomes more marked. Whereas there is a uniformity of colour in the dace, the chub may at sight be recognised by its dark, almost chocolate-coloured tail and back fins. The scales are also larger, and only average about forty-four in the lateral line instead of fifty-two in the dace. The extre e whiteness of the leathery lips of the chub also points out another difference, and the much larger mouth is another very conspicuous peculiarity of the chub. The inside of the mouth and throat is lined with an exceedingly tenacious membrane, from which the hook seldom tears, and the throat is armed with teeth of considerable size, in two rows, numbering three and five on each side.

The haunts of the chub in rivers during summer are chiefly under banks of clay fringed with osiers, and in winter in deeper lagoons and eddies near clay banks, into which they frequently bore. This is, however, for the purpose, not of hiding, but for the extraction of crayfish and such other crustacea as take refuge in the soft soil. It is not rare to find a chub with stomach completely gorged with young cray fish and silk weed. Chub are also found lurking round any ancient submerged structure, old camp shedding, piles, concrete blocks, and in spring they are frequently taken in the rough water of weirs with the spinning minnow or small bait. The root of an old pollard is, however the favourite "home" of your five-pounder patriarchal chub. He may cruise upwards and downwards seeking food, when unsuspicious of his inveterate human enemy, but instantly the hook pricks his leathery mouth he darts with incredible velocity back to the quiet hover he has made his home or out into the stream, and not until the last moment will he succumb, such is the courage of a large fish.

The food of *Leuciscus cephalus* consists of nearly all insect life, and he is particularly fond of the weed to which I have referred. Being a very good feeder, he delights in huge morsels, and I have known a 3lb. chub to take a frog almost full grown. It does not disdain the small members of its own family, but as a rule is not cannibalistic. It seems of a social albeit shy disposition.

Chub are in best season, in my opinion, from August to October, that is, best for sport and eating. I mention its season for the table because I by no means am disposed to endorse the absolute condemnation meted out to this fish in connection with its gastronomic value. It is very true that the French, according to Walton, term him *Un vilain*; but I have breakfasted before now most agreeably off a ½lb. or ¾lb. chub, simply fried

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with egg and breadcrumbs. To fillet the fish over night and sprinkle a little salt over it is a good plan. The head should not be thrown away, for, like the carp, its palate is a tit-bit, and there is some very "pretty picking" from the fleshy *caput* of Master "Loggerhead."

The methods to be employed in the capture of this fine sporting fish are various and all interesting. For my own part, I prefer chub fishing on the Thames to almost any other kind of sport on that river. For example, I know of nothing more agreeable on a fine summer's evening than to drop down—gently piloted, may be, by some fair rower—at a distance of from 10yds. to 15yds. from the osiers fringing the water's edge, and throw the red palmer, or white moth if twilight's gentle shades render the red palmer useless. Both the black and red palmers, or, indeed any well hackled fly will ever do execution, but absolute quietude must be observed. I mean by this that quietude and gentleness of movement are necessary more than that it is necessary to abstain from speaking. In fishing with an artificial fly always remember to neatly tie a piece of white kid on the hook. This, for some occult reason is a valuable "wrinkle" worth remembering.

Before proceeding to detail the *modus operandi* of chubbing with the ordinary running tackle I will give directions for "dapping" with the live frog. Of course, for "frog" the tyro may also read cockchafer, grasshopper, humble bee, cricket, or bluebottle—*et hoc genus omni*. The rod required is a longish rod with upright rings, and a soft line without knots. On to a No. 6 or 7 hook, hook a young frog, taking merely a slight hold of the back skin; about a foot above the frog have a pistol bullet or one a trifle larger; wind up your line until the pistol bullet hangs at the eye of the top joint of the rod; you have then but a foot of the line with the frog on, hanging loose, and this, having selected your place, you can easily push through boughs and bushes until the point be over the required spot; or should it be unusually thick, you may turn the line two or three times round the top till the frog lays close to the rod. By turning the rod the reverse way of course this will unwind when required. Being now over the spot where chub are supposed to be, yourself hidden by the tree or the foliage, give out line, which with a slight shake of the rod the weight of the bullet will begin to draw out; allow it to draw out gradually until the frog just touches the top of the water, but do not let the bullet or more than an inch or so of the line touch the water—indeed, it were better if none at all touched it. Of course, immediately a chub comes up and smacks his great white lips over the toothsome morsel, strike and proceed to kill your fish as soon as possible. The tackle naturally must be of the strongest description consistent with lightness, to resist the first terrific plunges of the fish. The process is not

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very productive of real sport, but it is effective, and in many cases is the only method practicable. A black slug cut across the belly, its inside removed, and turned partly inside out, threaded by a baiting needle, above a triangle hook, is very deadly used in this manner, and often brings to bag the largest fish of the locality. A blow line as described for dace is also admirable for small chub, but the proneness of the fish to seek its native banks, submerged trees, &c., renders this tackle unfit for fishing any parts but the shallows, its fragility being one of its excellent qualities.

The method for chub capture on the Thames, Trent, Severn, and such rivers, where a certain amount of water room may be had both for long swims and playing the fish when hooked, illustrates the "fine and far off" theory of the Trent-side anglers; for, as I have in the chapter on "Ichthyology" and above indicated, beneath the capacious forehead of our quarry lies a true *cyprinoid* brain, which renders it easily apprehensive of enemies. Unquestionably, therefore, in fishing for chub, the Nottingham tackle is simply the perfect ideal of what tackle should be for these fish. Early in the season or late—it matters not—the various baits can be used with advantage by its aid, during flood-time and snow, drought and heat.

After asserting so much, it may be necessary to describe the sort of tackle referred to under the generic title of "Nottingham," as applied to chub fishing. Description of a "Nottingham" rod in detail would be superfluous here, but I may remark that the length of mine is 12ft., and it is somewhat stiff, though light. The reel I use is the same as for Thames trout fishing, and is one of Wells' spring reels, so called from the facility, by means of a spring, with which it is taken apart in case of a complication taking place with the line. It (the reel) admits of a free action in every part, and therefore, during the first rush of the fish there is but little need of apprehension that the line by a sudden tension will break. The finger acts as a break on the facile movements. (By the bye, I shall introduce the reader to an improved modification in my chapters on "Tackle Making.") The line is a medium twist, undressed. I find the plait lines are not nearly so elastic as the twist; and, as they are closer woven, hold the water longer, thus interfering with the line's easy run through the rings. A light quill for shallow water, sustaining about four swan shot at most, which must be some distance from the hook; fine gut, which will be varied according to the state of the water, and medium-sized hooks, complete the outfit, with the exception of bait, which will require a more lengthened enumeration. Of course, this tackle requires variation as to size of float, strength of gut, and lead, at the discretion of the user.

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Now, as to its use. I would it were possible to communicate by "word o' mouth" the numerous niceties of this "Nottingham style." One of the principal difficulties experienced by the ordinary angler is the manipulation of the rod—as to striking, &c.,—with the left hand whilst the right controls the reel. The rod must not be held under any circumstances whatsoever in the right hand, but sustained between the left and the hip, or, in light rods, between the left hand and the stomach; and then the artful movements the proper guidance of the long line produces on the float, causing it to circle in the "chubby" corners of the bank and round eddies inaccessible by any other means; steering very close but just clear of the dangerous root or stump; securely floating between the Scylla and Charybdis of two opposite posts —all this is incommunicable by word-painting, and, as the reporters say, "can be better imagined than described"—in fact, indeed, must be seen to be understood.

However, the tyro may expect a fair measure of success if he follows the directions I am about to give. Having procured the rod and tackle above described, let him order of his butcher some bullock's brains and pith or spinal cord, and of his grocer some cheese. I am referring to autumn and early winter especially, it must be borne in mind. Let him proceed to Datchet, and, after procuring a punt, pass on, by "shooting" the Old Windsor Weir, to the back-water succeeding, yclept the "Fleet"—the right hand bank I know to abound with chub—and he has only to very quietly and carefully attach his punt to the boughs, and, taking some of the cheese aforesaid in his mouth, let him chew it small and blow it out, so that it falls in very minute pieces in a shower. There is a reason for this. Chub are gross feeders, and the tiny pieces attract them but by no means satisfy. After an interval—during which perfect quiet is the word —Piscator cuts some pieces of cheese about a quarter of an inch wide and half an inch long, and impales a piece on the hook—the hook protruding. Gently it falls in the water, gently, so gently, the light quill floats like a leaf down stream, the line passing glibly through the rings—on—on it is fifteen—twenty yards off, when down goes the float. Piscator strikes vigorously, the fish is hooked, and now ensues the "tug of war."

The chub, a three-pounder, perchance, comes racing up-stream, and he is reeled in just in time by the rapidly running reel to prevent his "loggerhead" diving amongst the *débris* of the bank. But the tackle is strong, if light, and the rod is reliable, if pliant, so the finality is, that, aided by his own skill, my representative Piscator lands his first three pound chub from Wraysbury Fleet. If he, in the course of the

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day, finds the cheese fail him, let him try the pith and brains in the same way, baiting with pieces of pith. But here I must not omit to say how the said pith and brains must be prepared before starting on a "chubbing" expedition. The pith is the spinal marrow of a cow or bullock, and when taken from the bone possesses two skins. The first must be removed by cutting the column open with a pair of scissors, and then "skinning" it off with the finger and thumb. Then boil the "pith" a few minutes until the inner skin becomes brown, when it is tough enough for use. The brains for the ground bait should be first boiled, and then chewed into minute portions and spat into the river while fishing.

I have started out for chub with these two baits in all seasons and times, and have never had to complain of the sport arising from one or both.

Greaves, or "scratchings," are also a capital bait in lieu of either of the above. Procure the greaves, if possible, from a small tallow chandlery (where a hydraulic press is not used), break them up and boil for twenty minutes, frequently stirring to prevent burning; leave them until cold and stiff, and choose the whitest for bait.

Of course there are other modes of fishing for chub and other baits. Blakey advises a humble bee. A very effectual bait is the real white moth at night, and a still more effectual bait is the black slug, before adverted to, either thrown expertly under the boughs in early summer, or used instead of cheese or pith. After being cut open and its inside removed, it should be laid for a short time in the sun. If this bait be put on as recommended for "dapping," immediately each fish is hooked it blows the bait up the gut, so that the same lure will serve again and again. Boiled shrimps and prawns are capital baits, and my favourite dew worm will sometimes obtain Piscator a splendid fish, giving the additional chance of a good perch occasionally. Wasp grubs and meal worms, red worms, brandling and minnow are all good for chub. Commend me, however, to the cheese or pith above all other baits.

Although I have pointedly alluded to Old Windsor Fleet as a good chub ground, it must not be imagined that the Thames is destitute of such spots. On the contrary, it may safely be said that there is no mile of the Thames from Oxford, and even above there, to Teddington Weir, which does not possess a chub swim, and when once they take up their position they may always be found "there or thereabouts."

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CHAPTER XVI.

THE IDE AND GRAINING.

THE Ide (*Leuciscus idus*), although generally known over all the northern parts of Europe, is so little known in England that it is indeed doubtful whether it has ever been taken from any of our home lakes or streams. I should not have referred to it here had it not been that Mr. Pennell, in the "Angler Naturalist," makes use of a statement that one was taken at the mouth of the Nith. I, therefore, for the benefit of any angler who may capture a strange fish at all differing from the ordinary *cyprinidæ*, render the following principal characteristics of the fish: The head is large and chublike; the mouth is, however, almost as small as a roach; outline of back convex—almost as much so, indeed, as a grayling; line of belly straight; scales and teeth almost precisely similar in number and size to those of a chub; colour, upper part of body olive black, with a bluish tint occasionally; side darkish grey; belly white; fins, all except back and tail, which are dark grey, precisely like those of a well fed chub. The fin rays are thus given by Pennell: Dorsal, 11; pectoral, 17; ventral, 11; anal, 13 or 14; caudal, 19. From this list it will be seen that the fish curiously comes near the chub in the numbering of the fin rays, except in those of the tail, which contains precisely the same number as the dace.

The Graining (*Leuciscus Lancastriensis*).—This is also a very rare local fish, being found, in some parts of the Mersey, the Lancashire Alt, the Leam at Leamington, and it is also said to inhabit the lakes of Neuchatel and Thun. I freely confess never to have taken either this or the ide, though I have seen specimens of both. Of the ide I obtained very few particulars as to capture; of the graining, however, I have something more to say in reference to capture, derived from an old Warwickshire

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labourer, who had taken these fish from the Leam when the stream was in a more prosperous condition than it is at present. This man told me that its habits were as nearly as he could describe like those of the brook trout, and its weight rarely exceeded half a pound. It takes the fly freely on occasions when in the humour, and would as readily sulk as does *Salmo fario*. Red worms were chiefly the bait used, and he had taken as many as six dozen in a few hours. The flavour was superior to dace, more like a trout, but the flesh was white.

I must fall back on my former authority for the principal characteristics, which are probably more reliable than those furnished by my note book, mine not having been made at the time of seeing the fish, but from memory afterwards. The length of head is said in this work to be, compared with total length of body and tail fin, as 1 to 6; depth of body to the same as 1 to 5. Nose more rounded than in the dace, the upper line of head being straighter, lower edge of foregill cover less angular, dorsal profile less convex. The back fin commences exactly halfway between point of nose and end of fleshy portion of tail, whilst in the dace it commences further back; all the fins somewhat larger than those of this fish in proportion; scales rather larger, and the number in lateral line 48. Fleshy part of tail is long and slender. Throat teeth in two rows, numbering two and five on each side. Colour: Upper part of head and body pale drab tinged with red and separated from lighter parts of body below by a well defined line; cheeks and gill covers silvery yellowish white; all the fins pale yellowish white.

I regret to thus close this chapter on these two almost unknown fishes, but as the tyro for whom this is written will hardly be likely to meet the fish often in his peregrinations after sport, what little I have said may be sufficient for the present purpose.

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CHAPTER XVII.

THE RUDD OR RED-EYE.

THE rudd (*Leuciscus erythropthalmus*) belongs to the second series of Leuciscini, of which the other members are the azurine, bleak, and minnow. They are so classified on account of the dorsal fin beginning some distance behind the ventral fins on the opposite of the body. It is an exceedingly beautiful fish, far surpassing its near relation, the roach, in variety of tints and brilliancy. Its general hue on the scales is a reddish or orange gold, varying, however, to light silver; its back is of a greenish blue, often of great vividness; its fins are of scarlet, varying to crimson, and its gill covers sometimes are bright yellow, at others paler; its belly likewise varying in colour. The irides are of a splendid crimson, and it is needless to say that from this the fish derives its name. Best says that this fish is also called Oerve or Nersling, and he opines that it is the "bastard roach" of which Walton speaks in the following passage: "There is," he says, "a kind of bastard roach that breeds in ponds, with a very forked tail and of a very small size, which some say is bred by the bream and right roach, and some ponds are stored with these beyond belief; and knowing men, that know their difference, call them rudds. They differ from the true roach as much as does a herring from a pilchard." He elsewhere also says, "Some say that breams and roaches will mix their eggs and milt together, and so there is in many places a bastard breed of breams that never come to be very large or good, but are very numerous." Mr. Pennell seems to greatly favour the supposition that rudd are a hybrid species of fishes. Let us examine this opinion.

Hybridity amongst fishes is rare, but certainly not unknown. Mr. Bartlett, of the Zoological Gardens, I believe, has crossed the varieties of the true carp, and but for two circumstances I do not know why the

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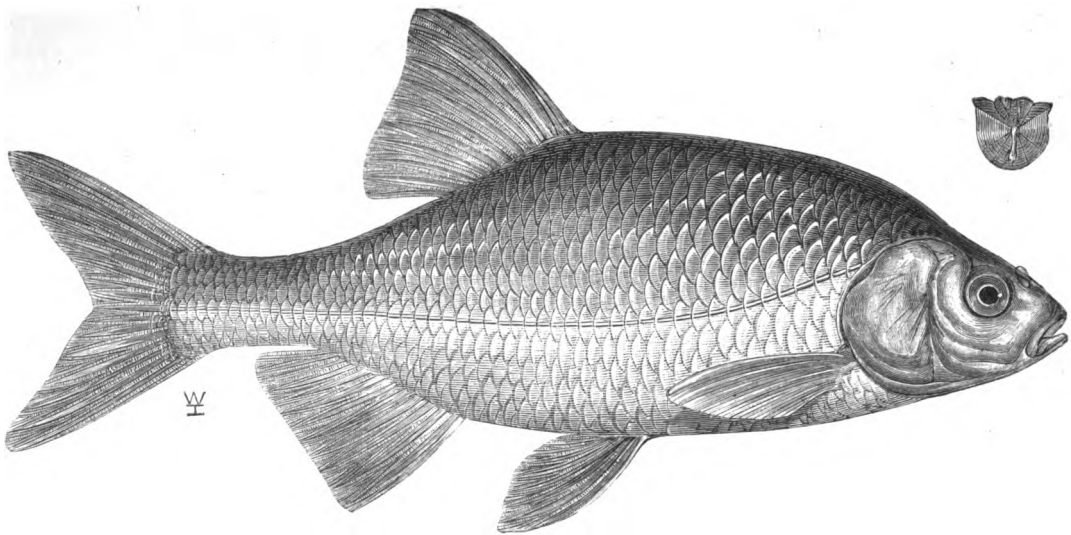

THE RUDD (*Leuciscus erythrophthalmus*).

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members of the *leuciscini*, here referred to, might not be capable of the same variation. These circumstances are of some weight, having been under my own observation. The first is that, notwithstanding repeated trials, I never knew the ordinary bream-flat, undoubtedly referred to by Walton, to spawn within ten days of the roach; and the other is, the period of incubation is different to almost the same extent of time. I believe it is a well-known physiological truth that no two warm-blooded animals having different periods of gestation will breed together, and why should not the same principle prevail amongst the finny tribes? The prolificacy of the rudd and their continuing types through countless generations is also presumably an argument in favour of their being a distinct species, as I cannot at present but think them to be. It is to be regretted, however, that authoritative experiments have not been made with a view to settle a question so interesting. It should be mentioned also that the scale of the roach and rudd indicate relationship, but that of the bream-flat discovers no similarity at all.

The rudd is found in nearly all parts of the Continent and Great Britain. It is the shallow of the Cam, the roud of Norfolk, and the roach of the Irish rivers. Of course, it can, however, be easily distinguished from *Leuciscus rutilus*, if only, as remarked above, by reason of the difference in the position of the dorsal fin. Virginia Water contains myriads of these fish. The Thames occasionally produces splendid specimens. The largest I ever remember taking myself weighed about 1¼lb., but I have seen several over 2lb., although usually the fish does not grow beyond ½lb. in ponds and lakes, where they breed rapidly. These fish, like roach, are much subject to parasites. They are remarkably hardy, and I have kept rudd out of water for hours on a cold day without apparently injuring them.

The fin rays are *usually* as follows, but occasionally vary: Dorsal 10, pectoral 14, ventral 9, anal 14, caudal 9. This numbering differs, I am aware, from the numbering of other authorities, but it is founded on many countings.

As to his capture I have little to add to the remarks I made anent the roach. Old Moses Brown says:

> The rudd, a kind of roach all tinged with gold,
> Strong, broad, and thick, most lovely to behold
> High on the surface will with freedom bite
> At small redworms or flies his like delight;
> But angler, when you hooked him, then take care,
> He struggles long, and breaks the single hair.

To which last line one might reply, "Not if the angler can land a roach of like size," for although I concede to the rudd on the score of beauty, I cannot yield him the palm of courage and gameness.

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Briefly to state the case as to angling for this fish, the tackle and baits used for roach are equally suitable. If any difference at all be made, thicker and coarser tackle may be allowable for rudd on account of greater boldness. The rudd is also of about equal gastronomic value with the roach.

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CHAPTER XVIII.

THE AZURINE, OR BLUE ROACH.

THE azurine, or blue roach (*Leuciscus cœrulues*) is an exceedingly rare fish, and is said to be found only in a few localities in the neighbourhood of Knowsley. Yarrell added it to the list of British fishes. A relative of mine has taken one from the Thames which weighed nearly ¼lb., whilst barbel fishing at Chertsey, and he thus describes it:—Very much like the rudd in configuration, but of a slate blue colour on back, and belly silvery white, and white fins. It took a lobworm.

Its flesh is said to be firm, of good flavour, and its habits are like those of the carp. It spawns in May. Its other general characteristics are: Depth of body compared with length of head and body only as 2 to 7. Nose blunt, head small and depressed, back and belly rather convex, mouth small and toothless, throat teeth in two rows, numbering 2 and 5 respectively on each side, scales large, and differing from those of the rudd, being much less striated than either that fish or the roach; scales in lateral line about 42, lateral line concave. The dorsal fin commences half-way between eye and end of fleshy portion of tail, pectoral fins rather long, reaching almost to the origin of the ventrals, which arise in advance of the dorsal fin, thus bringing the fin over the space between the ventral and anal fins. Fleshy part of fins narrow; tail deeply forked. By the same authority the fin rays are stated as follows:—Dorsal 10, pectoral 15, ventral 9, anal 12, caudal 19.

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CHAPTER XIX.

THE BLEAK.

THE bleak (*Leuciscus albumus*, from *albus*, white), blay, or willow-blade, as it is prettily termed in Yorkshire, next demands our attention. The name bleak is taken from a northern word signifying to bleach, to whiten (*blik*, Danish; *blick*, Swedish; and German, *blicken*, to "glimmer or glance"). It is found in nearly all rivers throughout Europe, and in prodigious quantities in the Caspian Sea. It is also plentiful in the Seine, Marne, and Moselle. The following is a detailed description of its physique and general appearance: The colour on back, head, and tail, and back fin, a bluish green, sometimes varying to almost whitey green, at others to a beautiful pea green; pectoral and anal fins nearly of the same hue, with similar variations; ventral fins pure white, sides and belly a sheeny silvery white, sometimes—rarely—iridescent; eye golden yellow, with green tinge; the scales are rather small and slightly set, so are easily detached, the sides compressed and flattened, back very little convex. Now for proportions. The whole length of the fish, head, body, and tail fin, if considered as 6, the length of the head is as 1, and is small and delicate, with under lip projecting slightly and a fragile grayling-like upper lip. Depth of body from shoulder to commencement of pectoral fin somewhat greater than length of head. The back fin, unlike the dace, commences much nearer the tail than the opposite ventral fins. The back fin of the dace commences *just over* the ventrals. So much for a technical description. A word-painting of the little fish's slender brilliant beauty would be out of place in a work devoted to "practical" considerations, so I must perforce leave the above in all its bare precision.

The bleak spawns in May and June, sometimes earlier but rarely later, and is exceedingly prolific. Like the dace and roach they assume a certain roughness, and the males often congregate in immense herds during and after the process of impregnation. At Anjou, where the

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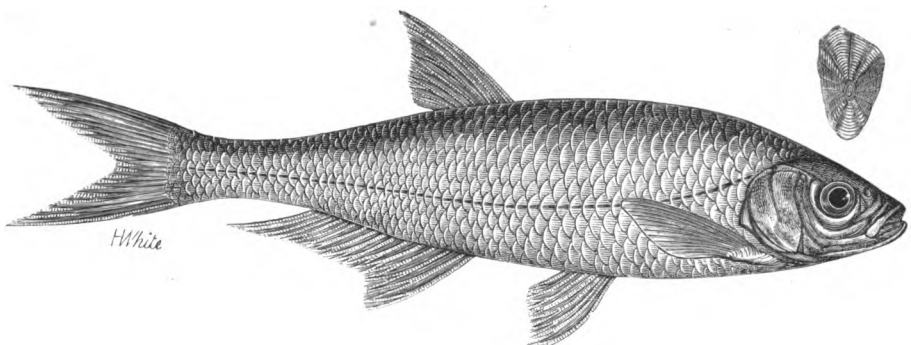

THE BLEAK (*Leuciscus alburnus*).

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culture of this fish assumes considerable importance, I am informed that a rude sort of fish culture is resorted to. Artificial sandbanks and hurdles are placed conveniently in protected spots for the bleak to spawn on, and it is conceivable that even this primitive measure greatly facilitates the operations of the parent fish and tends to preserve them. As with all the rest of the carp family, so is it with these little fishes at the spawning season. Its critical processes develop disorders in bleak, and often bring about the death of an otherwise apparently healthy fish. Bleak are particularly prone to the larval tapeworm before spoken of, and the agonised spasmodic struggles of an occasional fish are at this time frequently to be seen. Nor is this form of malady confined to the spawning season. On bright clear days it is by no means uncommon to observe a bleak glancing and flashing through the water, apparently beside itself for some cause or other. Thames fishermen are credited with terming such sufferers "mad bleaks." Sufferers they surely are, in my opinion, from the fact that on opening these "mad" fish I never yet *found one without one or more tapeworms* to account for its eccentric evolutions. This should be good ground for the inference drawn. The conjecture has been hazarded that these glancing, flashing movements are consequent on a desire in the fish to "clean" itself after spawning. I am inclined myself, however, to the former supposition. The size of the bleak rarely exceeds 9in.

Perhaps the most remarkable feature of the life-history of the bleak is the fact that it has been pressed into the service of the great Moloch—Fashion. M. Meniere, in the "Journal of Applied Sciences," gives the whole history of the employment of bleak in the manufacture of artificial pearls. It appears that in the seventeenth century an ingenious person (M. Jaquin) most successfully imitated pearls by means of the "Oriental Essence," which was a name given to an oily product of the scales of the fish to keep its origin secret. The name now given to this product is *guanine*. Mr. Pennell, in the "Angler Naturalist," says: "So great at one time was the demand, when the fashion of wearing imitation pearls was at its height, that the price of a quart measure of scales varied from one guinea to five. At one factory alone in Paris, 10,000 pearls were issued per week; and, when it is considered that each pound of scales costs the lives of 4000 fish, and that this pound only produced 4oz. of pigment, some estimate of the destruction effected amongst the bleak may be formed. The Thames fishermen gave themselves no trouble beyond stripping off these valuable appendages, throwing away the fish when scaled. Roach and dace and some other fishes also furnished a colouring substance, though of inferior quality, the

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best of all being procured from the whitebait; and it was the custom amongst hawkers regularly, before selling any 'white fish,' as they were termed, to supply the bead makers with their scales." Some idea may be formed from this of the magnitude of the trade, and also, it may be said, of the plenitude of these little fishes in the localities where the manufacture was carried on.

The chief places from which the "Oriental" essence was derived were on the southern coast of France, Anjou, Ecoufflans, and Point de Ce. The process of detachment from the fish is as follows, and was principally carried on by children: The fish are taken when quite fresh, and the scales scraped into a shallow tub containing a little water. The dark dorsal part of the fish is not scraped, as the scales on this part are yellow and useless. The whole is ultimately received in a horsehair sieve.

The first water is thrown, and the scales are gently washed and then pressed. The essence settles to the bottom of the tub as a brilliant blue-white oily mass. The pancreas and intestines of the fish possess this "essence," but these are (or were) thrown away as useless. The "Oriental Essence" is then put into tin boxes, filled up with ammonia, and sent into Paris. In filling the pearls a tiny tube draws up a quantity of the guanine, and it is then injected into the hollow bead. A current of dry air is then passed over the pearls, and they are ready for market. If greater solidity is required they are filled with melted wax.

The guanine, or oriental essence, under the microscope, seems to be composed of an albumenoid oily kind of liquid, in which swim multitudes of tiny scales. The largest of these are rectangular in shape, about four times as long as wide, and each has three colourless cylindrical veins. The guanine is difficult to mix with water, and is insoluble in acetic acid and ammonia, but combines freely with sulphuric acid. Heat coagulates it into a thick white mass, which afterwards turns black, if not prevented by instant cooling. Such are some of its physical characteristics. It has been conjectured that it is a natural secretion, very much resembling the secretion of the oyster which forms the true pearl, and there seems some very reasonable grounds for this view.

Gastronomically I esteem *Leucisus albuminus* as on an equal with the salt-water sprat. Walton terms him the fresh-water sprat; not a bad description. Mr. Pennell says the fish is good marinated; I prefer them fried in oil, or as gudgeons are cooked by one or two Thames fishermen's wives I could name. They are exceedingly delicate eating, and I frankly confess I esteem them as being very toothsome if carefully dressed as I have indicated. I have often wondered if they preserve well in oil *à la* sardines. Here is a hint—look to it, ye gastronomers!

In angling for this fish it must, of course, be borne in mind that no

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high class sport will be had, yet the bleak is by no means destitute of fighting power, and if very fine hair tackle be used, the angler may derive some very agreeable pastime. Indeed, I know of no fish which is likely to sharpen the piscatorial faculties of a youthful angler more effectually than fishing for these fish with the fly. An artificial black gnat tipped with a gentle, or piece of white kid, is very killing, but a gentle, caddis worm, or natural insect will all be effectual. I hold a brief for small fry fishing. I am always pleased with it under certain conditions, and I am sure it is as necessary that the angler, if he would be a perfect brother of the craft, should know how to catch his bait as that he should know how to put it on his hook or hooks. There are times in summer when anything but bleak or some other small fry angling is out of the question, and then it is that many an hour may be pleasurably employed which otherwise would be swallowed up in languid, unhealthy *ennui*, if the angler will but turn his attention to the exquisite minutiæ of bleak fishing.

> The pleasant'st angling is to see the fish
> Cut with her golden oars the silver stream
> And greedily devour the treach'rous bait,

sings the immortal angler-poet of Avon, and it matters not whether he referred to bleak fishing or not, the verse is true, and may be applied to it. I speak for myself, anyhow, and I affirm I have experienced more real enjoyment in watching the white gentle and the darting agile "willow-blade" in the translucent water of summer than in the capture of many a sturdy barbel or voracious pike.

The chief haunts of bleak in rivers are in eddies caused by strong rushing streams; in fact, anywhere where a Thames trout might be supposed to be there you will find bleak. A striking instance this of the "eternal fitness of things."

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CHAPTER XX.

THE MINNOW.

THE minnow, or as Walton calls him (and he is so still termed in many parts of England) the pink (*Leuciscus phoxinus*), is the smallest of the carp family, and rarely grows to beyond 3in. I certainly know of one exception to this which was taken from the Colne, near Staines Moor, and measured 4½in., but never before nor since have I seen one beyond 3in. The ordinary size is from 1in. to 2in.

The minnow (from the Latin *Minumus*) is found in nearly all the streams of Great Britain, and is essentially a shallow water fish. I have good reason for saying that it cannot sustain life even in great depths from the following incident: Some year or two since it became necessary to fish for some of the large perch found in the Obelisk Lake, Windsor Park, for the household of H.R.H. Prince Christian. To this end, lines baited with some exceedingly fine fresh caught Colne minnows were arrayed and laid partly in the very deep water near the pond head (about 29ft.), and partly in the shallower water contiguous. On taking up the line after some quarter of an hour's waiting, it was found that all the minnows which had been lowered into the deep water were dead and stiff, showing, indeed, in so short a time a peculiar amount of rigidity. I subsequently made several experiments which convinced me of the superior density of deep water, and of the inability of minnows to endure this. I may say that gudgeons were not similarly affected.

The minnow is, as almost everybody knows, a delightfully handsome vivacious little fellow. Just before the spawning season in May the fish undergoes a remarkable alteration of appearance, especially the females. In this, as will be seen, it essentially differs from the stickleback, the male of these fish alone changing his coat. The minnow is, if possible, more gorgeous than the stickleback. The hues vary from an intense bluey-green on the back and orange on the belly to an olive back and gradations of

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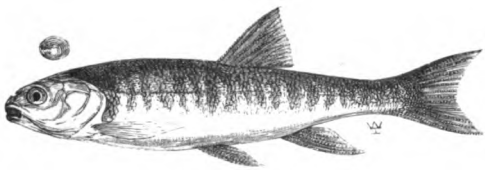
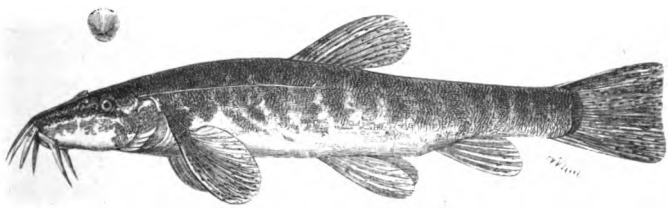


THE MINNOW—(*Leuciscus phoxinus*).



THE STONE LOACH—(*Cobitis barbatula*).

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crimson and carmine on the sides and belly. The eye also assumes a brilliance of crimson which is unspeakably beautiful, and the voracity of the fish seems doubled. The head and scales—but especially the head—become covered with tiny tubercles, which disappear immediately after spawning. The operation does not occupy more than three days, and the growth of the fry is exceptionally rapid. During spawning time the parent fishes often at night time glow with marked phosphorescence.

Although not to my knowledge cannibalistic or pugnacious, the minnow is decidedly voracious. They live on minute water insects and minute vegetable organisms, which, on microscopic examination from some waters, exhibits a long list of remains of animalculæ and other *débris* more or less capable of identification. The little fellows are hardy, and seem to thrive best in rather hard water. Mr. Pennell says that they will not live over three years. This is an error, for I have ample proof that five and six years are not excessive instances of longevity.

I have before referred to the difference which the pigment of the skin of various fishes presents, according to the colourable characteristics of the waters from which they are taken and the state of the health of the fish. Thus a perch will vary from a light dusky striped brown to a deep olive, and trout also vary in a similar manner. In reference to the latter fish, Sir Humphrey Davy says, "the colouring matter is not in the scales but in the surface of the skin immediately beneath them, and is probably a secretion easily affected by the health of the fish," and, of course, these remarks are applicable to any other kind of fresh-water fish at least. In none other is the variation so marked as in the minnow. For the sake of convincing myself of the chameleon-like character of the pigment in question, I made the following experiment:—I took five ordinary gallipots, and painted the interiors of four as follows: Black, red, blue, and yellow, the fifth remained untouched, and was, of course, white. Thus I had the three primary colours and their ultimate combinations. The three jars were placed in a row in equal light—not sunlight, but light through a frosted pane, and, having filled the pots equally with water from a dark bait cistern, I lifted simultaneously five strong lively minnows, and placed one in each receptacle. The colour of each at this time was uniformly dark olive on the back. In the course of two hours each specimen presented a different colour, when all were replaced in a black painted can. The fish in the black jar remained unaffected, that in the red was somewhat lighter and clearly mottled, that in the blue rather of a browner tint, that in the yellow of a yellowish dirty-brown hue, that in the white of almost a straw colour. I replaced them during that and the ensuing day in the pots in a different order, varying them once or twice in this way with almost immediate results, which were exceedingly curious. The

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experiment led me to believe that the colouring matter is exceedingly sensitive. The experiment recorded is worthy a trial, if only for the sake of the interesting and rapid changes shown.

The throat teeth of this little fish number usually two and four on each side, and are in two rows, of course. The fins rays: are Dorsal nine, pectoral sixteen, ventral eight, anal nine, caudal nineteen, sometimes varying.

The adult fish in winter time are exceedingly gregarious. They are so in a lesser degree in summer, but in the latter part of the year congregate in quantities, as if seeking warmth from contiguity. I have thrown a cast net over from twenty to thirty dozens in a space hardly exceeding the size of a silk hat. The curiosity of the little fish also is very strongly developed, and it is not a rare sight to see half a dozen diminutive minnows closely inspecting a large pike as he lies asleep or torpid, swimming round and round, as the pilot fish is said to do in connection with the salt-water shark. The chief enemies of the young fry are the various larvæ of the ephemera and coleoptera, and as soon as they are hatched they, possibly having a forewarning of their adversaries, seek the higher strata of water, where they are comparatively free from such voracious destroyers. Mr. Pennell says they bury themselves in the gravel to get away from the aforesaid larvæ; as, however, I know this not to be the case, it is scarcely worth while to raise doubts as to its cause, on the ground that the little fish would in the gravel meet what it is to their personal interest to avoid.

Before leaving the minnow I may be allowed to say that the tiny fish are little less delicate and toothsome than whitebait if cooked in the same way. Izaak Walton refers to their demolition in this way by saying that they make excellent "minnow tanzies," and gives directions for so preparing them. They are to "be well washed in salt, and their heads and tails cut off and guts taken out." They are thereafter to be "fried with yolk of eggs, the flowers of cowslips and of primroses, and a little tanzy; thus used they make a dainty dish of meat."

I suppose, although I profess to instruct novices in the "gentle craft," I shall not be called upon to teach the angler how to catch minnows, except by trapping. For particulars how to do this see previous chapter.

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CHAPTER XXI.

THE LOACH.

THE Loach (*Cobitis barbatus*), sometimes termed stone loach, from its habit of burrowing under stones, and beardie, from the barbules at its mouth—varying from six to ten—is a little gudgeon-like fish inhabiting most of our sharp rills and streams. Like the minnow, it is rarely found in deep parts, but frequents the shallower spots of the stream, where a constant change of water is one of the chief features. From careful experiments I am led to the conclusion that the sight of the loach is not greatly developed, but I have no doubt that its sense of sound and touch are exquisitely sensitive. Like all ground fish, also, such as barbel, gudgeon, carp, eels, and chub, it is very susceptible of electrical impressions. The agitation of one of these fish in an insulated glass globe of water charged with electricity is painful to witness, and sufficiently declares the fact.

Perhaps the most remarkable feature of the loach consists in its possessing an air bladder, inclosed in a bony capsule, behind the head. The capsule is divided into two compartments; the arrangement is considered by Professor Owen to be subservient to the fish's perception of sound. Its swimming movements, although sufficiently volatile when made contiguous to the ground, are nevertheless awkward, and indeed painful, when the effort is directed to attaining the surface of the water. The fish spawns in April, and seems to be extraordinarily prolific.

The loach is unconquerably shy, and, like some of the Indian mud fish, delights in creating a muddy cloud around it whilst feeding. This fact strengthens my idea that its sight is, from not being of great service in searching for food, imperfectly developed. It is very voracious, and will devour comparatively great quantities of worms and other insects. Its teeth are numerous, and in one row only. I am of opinion that the fish is not at all herbivorous, but entirely carnivorous. It is of considerable

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repute for the table where plentiful, and Linnæus asserts that Frederick I. of Sweden had it imported into that country from Germany for his own particular eating. Gesser is credited by Walton with asserting that it is "very grateful both to the palate and stomach of sick persons." The loach is a bold biter, and may be taken with a red worm and small hook just before dusk in summer. The most primitive tackle suffices.

The spined or ribbon loach (*Cobitis tænia*) is another and the only other species of loach found in England. I have met with it in Warwickshire, and it is said to be occasionally found in Wiltshire, Nottingham, and some tributaries of the Cam. It is, however, extremely rare.

The size of the spined loach rarely exceeds three inches, and has its head defended by two forked spines below the nostril, whence its name. The slender shape of the fish gives rise to the appellation "ribbon" loach. It is said to emit a guttural sound on being touched, but I cannot ratify this. The only specimens I have seen did nothing of the kind. The general colouring of this species is precisely similar to its congener, viz., head, body, and sides clouded with brown on a yellowish ground; belly and under parts white or yellowish; all fins spotted with brown; the irides of the eyes are of a beautiful pale blue.

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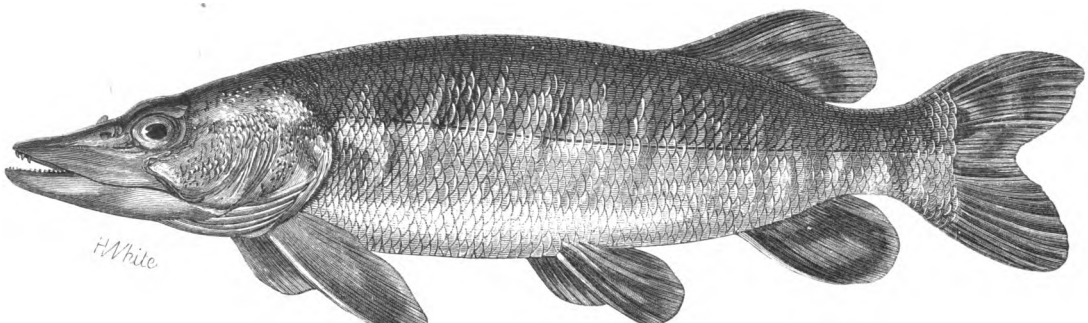

THE PIKE, JACK, OR LUCE—(*Esox lucius*).

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CHAPTER XXII.

THE PIKE, JACK, OR LUCE.

THE *Esox lucius*, or pike, stands at the head of the family of the Esocidæ, and is comprised under the sub-genus Malacopterygii, or soft-finned fishes, in contradistinction to some other fishes of prey, such as the perch, which falls under the sub-division Acanthopterygii, or prickly finned. For various reasons, it is of next importance to the Salmonidæ; and from the voracity of its appetite and the unrelenting fierceness and boldness of its general nature, it has been termed by Buffon the fresh-water shark.

According to Couch this fish is a native of Ireland, Scotland, Sweden, Norway, Upper Baltic, Spain, Colder Asia, China, and America. The Roman, Pliny, speaks of an esox in the Rhine attaining the enormous weight of 1000lb. Ausonius, in the fourth century, says it is a fish of the Moselle, and Juvenal, as will be seen hereafter, refers to it unmistakably as being a fish of the Tiber.

The American continent produces it in great abundance, as well as several allied species, each possessing indisputable characteristics of the *Esox lucius*. The following is the American nomenclature:—pike, Canada and the North-west; lake and northern pickerel, New York; jack, Virginia; big pickerel, North-east. All of these are proved to be the *Esox lucius*, the pike of Linnæus. The Mascaloye (*Esox estor*) is the only differing variety of consequence.

The first thing which arrests one's attention on examining this fish is the immense muscular development of its motor powers, viz., the tail and adjacent fins. The fish is evidently expressly fitted for chasing and capture, and for the consumption of animal food only. The eye is placed in the top of the head, to enable it to seize from below. It is a fish of ambush. Its colour resembles the weeds in which it hides, and, like the Lincoln green, in which the Sherwood foresters were clothed, this hue is

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often so precisely similar to the surrounding circumstances of its habitation, that it is impossible to detect except by shape the difference between the green rush and the *Esox lucius*. And then the cruel, strong, enormous jaws, with the razor-like fangs! Whoever has observed the fish seize on its prey, and marked the repeated grips of that remorseless jaw, will not forget the feeling of aversion which thrilled through him as he watched.

Whilst thus adverting to the teeth of the pike, it may interest the reader if I reproduce the substance of a paper published in the *Quarterly Journal of Microscopic Science* recently on the hinged formation of certain of the teeth of this fish. The fisherman who may have noticed the celerity with which a large bait is swallowed may have suspected the presence of such fangs. Like the angler-fish (a member of the same family) and the hake, the pike has them very fully developed. The paper referred to is by Mr. Charles A. Tomes, M.A., F.R.S. After remarking on the peculiarity of hinged teeth in the above-named fishes, this gentleman goes on to state that those hinged teeth have certain characters in common; they are all capable of being bent down by very slight pressure, but in a single direction only; to force applied in any other direction they are rigidly immovable. This direction, with certain variations to be described, is inwards and backwards towards the gullet, so as to facilitate the ingress and the swallowing of food; on the removal of the pressure they rebound to their upright position.

It appears to Mr. Tomes very probable that adequate examination will discover the existence of hinged teeth in many other predatory fish, as it has long been overlooked in fish so common as the hake and the pike; meanwhile, it is interesting to note the occurrence of an adaptive modification involving a considerable degree of specialisation occurring in fish so dissimilar in other respects as the angler, the hake and the pike.

And what is still more significant is the fact that, whilst the result attained is pretty much the same in the three fish selected for comparison, the details of the mechanism by which it is attained differ markedly, especially in the last two. In the angler and in the hake, the teeth which are hinged form the inner and larger of two rows of teeth set upon the margins of the jaws; their mobility is therefore serviceable in the way of offering no obstacle to the ingress, but opposing the egress of prey. In the mouth of the pike, on the other hand, the marginal teeth are rigidly anchylose, and the hinged teeth situated on the vomerine and palatine bones are useful, not in the catching, but in the swallowing of the prey.

In the pike the margin of the upper jaw is toothless (with the exception of a few almost rudimentary teeth in front); the lower jaw is

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furnished in front with small teeth, but at the sides with exceedingly long, sharp, piercing teeth, firmly anchylosed to the bone. Looking into the mouth, three nearly parallel bands of teeth are seen upon the palate; in the central band (upon the vomer) the largest teeth are in front, while in the lateral (palatine) bands the largest teeth are those occupying the innermost position along the band, though in these also there is some diminution in size towards the back of the mouth. All the teeth which form these three bands are set upon hinges (with the possible exception of the very smallest), and are capable of being bent down in certain determinate directions until they assume a nearly horizontal position.

The teeth which lie upon the median line of the vomer bend directly backwards; those upon the sides of the vomer backwards and a little outwards.

The teeth upon the two palatine bones bend backwards and inwards, along a line forming an angle of 45deg. with the median line of the mouth; it is to be noted also that the palatine teeth, especially at the back, descend to a lower level than the median (vomerine) teeth. A moment's consideration will show the *modus operandi* of these hinged teeth with their mobility restricted to a single direction. It is the habit of the pike to prey upon other fish, often of relatively large size, and these can only be swallowed when they are conveyed to the gullet in a longitudinal direction, either head or tail foremost. The fish is taken into the mouth of the pike either uninjured or but slightly maimed by having been seized by the large marginal teeth the mouth is then tightly closed, and the prey held up against the palate by the elevation of the tongue and floor of the mouth. In this position the movement of the prey is rendered all but impossible save in one direction. So long as it lies longitudinally along the median line, between the two palatine bands, its passage backwards to the throat is unobstructed, the hinged teeth giving way before it; but movement in any other direction is checked by its becoming caught upon the sharp points of teeth rigidly fixed against it. Thus the very struggles of the prey are probably utilised in bringing it into, and arranging it along, the median line of the mouth, so that it can be easily swallowed. During this process, which, unless the prey be small, lasts some minutes, showers of detached scales issue from beneath the gill-covers of the pike, thus giving evidence of the employment of the teeth within its mouth.

The light which Mr. Tomes sheds upon the masticating power of pike will be acceptable to all those interested in piscine natural history.

The size to which pike, under certain circumstances, will grow is astonishing. The old stock story of the Mannheim pike, which is

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gravely given by Eleazar Block, quoted by Gesner and by Posson Maisonneuve, as well as by every writer on fishes since, for the sake of consistency, must again be given. "In the year 1497 a person caught at Kaiserlautern, near Mannheim, a pike which was 19ft. long, and which weighed 350lb.! His skeleton was preserved for a long time at Mannheim Museum. He carried round his neck a ring of gilded brass, which could enlarge itself by springs, and which had been attached to him by order of the Emperor Frederick Barbarossa 267 years before"! Monsieur Posson Maisonneuve, whose words I have used, concludes the recital in a touchingly pathetic manner: "What a tremendous quantity," he says, "of animals more weak and feeble than himself he must have devoured in order to nourish his enormous bulk during so long a series of years." Notwithstanding the array of credulous writers who have given currency to this tale, I must, unwillingly, indeed, beg to doubt the enormous weight of body if not of years. Anyhow, it is a matter of congratulation that no such monsters exist in our own lakes, or it would be necessary to restrict bathing and indiscriminate angling to a great extent. Steam cranes and lifts would in such case be in vogue rather than fishing-rods, and windlasses rather than Nottingham reels; chains, not lines; and, for floats and baits, empty barrels and live bullocks. That the pike does grow rapidly and live long I have no doubt at all. In some of the deep mountain tarns of the Principality there are some enormous fish. One of these, it is said (deducting duly for all the national exaggeration), possesses pike to the size of 50lb. to 70lb. The magnificent pike belonging to Mr. Jardine, and that from Rapley Lake, Windsor Park, are monuments of growth. The age of either does not, however, seem to be great. That of the one from Windsor Park I know is only from twelve to fifteen years old, the circumstances of his career being as follows: In 1861 or 1862 Sir James Clark's butler put some small pike in the lake, which had previously been dry for some considerable time. After that carp in tolerably large quantities were added, upon which fish (and his *confrères*) he no doubt fed. Pike seem to thrive on carp.

In his general character the pike is a monogamic fish, and it is a matter of constant remark that where one tolerable fish is to be found another usually is somewhere near, and the duad seems in all cases to be male and female. Another curious fact may be "noted," namely, that after a large fish has been caught from any particular spot, especially in a river, another almost immediately takes the vacant place, as if performing the duty of sentinel over some hidden treasure.

Pike spawn in April sometimes, and occasionally, if the water, from land floods or any other cause, remain chill and at a lower temperature than is

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ordinary for the time of year, the spawning is retarded (as in 1877 season, I remember) till June. This, however, is singular, and of rare occurrence, the usual period being in warm May days. The smaller fish spawn first, and the larger in regular gradation. It is very amusing to observe the "loves of the fishes," as an old Italian author words it. I have seen the male fish gently rub against the side of his mate until the latter has insensibly been pushed up on dry land and secured. Nor would the male fish leave the spot until I again restored his *fiancée* to the element from which his pikeship had so ungallantly pushed her. The spawning is the only season when the pike seems to exhibit any departure from the unrelenting ferocity of its character, excepting when, out of gratitude, as has been asserted, it spares the tench. (See chapter on "Tench.") Couch quotes Lund to the effect that a fish of 35lb. contained 272,160 grains of spawn.

Apropos of the spawning of pike, the writer in a German paper of natural history gives his experience of lake pike. He has observed that four or five weeks before spawning commences the jack seek the neighbourhood of the shore in groups, and almost invariably each of these consists of one female accompanied by one or more male fish, and so continues, unless disturbed, till the breeding season is over. As a rule a female of small size is accompanied by one male only; a medium sized mother-fish has two or three males, and a full-sized one as many as four or five. The larger the mother-fish the smaller, as a rule, are her attendant squires, the weight of the former being generally about equal to that of all the males put together. If the males of a group be caught shortly before spawning time, the bereaved female does not mate again that season; in due time of course she deposits her roe, but it remains unfertilised, and so perishes. By removal of some of the dorsal scales from all the members of a group taken in a net, so as to render their identification easy, it was found that on replacing them in the water at considerable distances from each other, they invariably reunited in a very short space of time. Under no circumstances was the spawn of a female bereaved of her attendant males, impregnated by the milt of others in the same water, however numerous the latter might be.

The blood of the pike under the microscope exhibits in a remarkable degree that corpuscular movement spoken of by Carpenter ("Microscope," page 712), and the variations in form of the molecules are exceedingly interesting. The best method is to secure a very young pike, and whilst keeping the body in cool water, to extend the tail over the slide. The blood corpuscles are oval, and are estimated in size in Mr. Gulliver's edition of Hewson's works at about 1-2000th of an inch long and 1-3555th of an inch broad.

The digestion of the pike is extraordinary. Not only will it get rid of

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the perch by assimilation, but the crayfish is sometimes crushed by its powerful jaws; and if not completely dissolved in the stomach, is yet so far digested as to admit of fæcal ejection in the ordinary manner. Gorge hooks have been repeatedly taken from the maw, and some time ago it was my good fortune to extract a sixpence from a 3lb. fish. I at the time remarked that a piece of rusted steel hung from a hole drilled in one side of the coin, and I suppose this was the remains of a hook. The piece of silver had evidently been used as an artificial bait, and not a bad one, either. This style of bait is very killing for mackerel. I may add that the sixpence was greatly discoloured by the action of the gastric juice. Perhaps there is hardly anything, from a piece of red flannel to a boy's leg, that, like the ostrich, this fish does not consider himself equal to assimilating for his sustenance, and its voraciousness is of course in comparison. Even the quantity of food naturally consumed is enormous. Jessé gives an instance in which it was ascertained by actual experiment, that eight fishes of ordinary size consumed 800 gudgeon in three weeks. I quite believe in the probability of the Arabian Nights' story of the Fish and the Diamond, after witnessing the extraordinary variety of food the jack swallows. Dr. Crull, in his "Present State of Muscovy (1698)," actually maintains that a child was found in the stomach of a large pike, caught in the Volga about that time, and Rhondeletius speaks of an instance in which a pike took a fancy to the nose of a friend's mule, and on the animal starting back from where it was drinking *Esox lucius* was secured.

It is very clear to me that the comparative absence of any sense but vision and hearing leads the pike into the most egregious mistakes in his selection of food. The natural fierceness and impulsive ferocity of the creature, coupled with a fearfully voracious appetite, notwithstanding his splendid visual faculties, plunge him into all sorts of difficulties, some of which are of considerable danger. His brain, unlike the carp, is but sparely developed, and it is not at all an extraordinary occurrence for a pike to leap on dry land, pursuing a bait with lighting-like speed, regardless and unaware of consequences.

A remarkable structure in the eye of this fish has been discovered according to Couch, by a Mr. Drummond (Charlesworth's Magazine of Natural History, vol. 2), which appears to show a special force of measuring distances by sight. "In no British fishes," the same author remarks "are the three bones (of these ololiths) on each side so decidedly visible."

Some of the earlier writers on natural history have credited this fish with great refinement of taste. I can hardly accord with them, however. It is maintained that there are some particular things

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that the pike is passionately fond of; amongst these are the following: A swan's head and shoulders, a mule's lip, a Polish damsel's foot, a gentleman's hand, tender kittens before their eyes are open, and the fleshy part of a calf's head. At the same time, there are things which the fish abhors. "In the midst of a banquet of frogs throw him a toad, and he turns from it with loathing; put a slimy tench near his muzzle, and he will recoil from the nauseous creature," and so on in respect to the stickleback and perch. It is needless for me to comment on this. A pike will take a young toad almost as well as a frog, and, if not very fond of a tench, it does not loathe it. It readily takes a perch, and I have found heaps of stickleback in both trout and pike.

Before passing on to other considerations there is one circumstance which occurs to me in connection with its life-history which is interesting, as showing that this tyrant of the water has other enemies occasionally besides his lord and master, man. Perhaps I cannot do better than give it in the words of Mr. Blakey. He says: "Mr. Lloyd informs us that it is not an uncommon thing in the north of Europe for even the voracious pike to become the prey of a feathered enemy. Eagles frequently pounce on these fish when basking near the surface; but when the pike has been very large, he has been known to carry the eagle under water, in which case the bird, being unable to disengage his talons, has been drowned." Capt. Eurenius informed the same author he was once an eye witness of a performance of this kind. In this instance the eagle succeeded in lifting its prey to some distance above the water, but the combined weight and struggles of the fish soon drew both down into it. Soon after the bird was seen at the surface of the water uttering piercing cries, and apparently striving to free its talons. It seemed in vain, however, for presently the eagle disappeared in the water to rise no more. Eagles have been found dead with talons tightly clenched in the dead fish washed ashore.

The pike is probably so named because of its shape; possibly the length and shape of its fangs had somewhat to do with the name. The word pike (which is represented by the French *pique* and the German *pieke*), as is well known, means, according to Johnson, "a long wooden shaft or staff, with a *flattened pointed* steel head." This is sufficiently explanatory of the probable derivation of the fish's first patronymic. As for the term "jack," there are so many meanings attached to the word that it is utterly impossible to decide its origin in this particular case; possibly it may have come from the Norman *jacque*, or the German *jacke*, a coat of mail, but nothing can be finally settled about the matter. The term luce also is equally obscure as to its parentage, but probably is from the Greek *lukos*, and is usually applied to a pike when full grown (*vide* Johnson)—Query,

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When is a pike full grown? Shakespeare makes use of the latter term in the following manner ("The Merry Wives of Windsor," act i., sc. 1):

SLENDER.—A gentleman born, master parson; who writes himself *armigero*—in any bill, warrant, quittance, or obligation—*armigero*.

SHALLOW.—Ay, that I do and have done any time this three hundred years.

SLENDER.—All his successors gone before him have done't; and all his ancestors that come after him may; they may give the dozen white luces in their coat.

SHALLOW.—It is an old coat.

SIR HUGH EVANS.—The dozen white louses do become an old coat well; it agrees well passent; it is a familiar beast to man, and signifies—love.

SHALLOW.—The *luce is a fresh fish.*

The armorial bearings of the Lucies contain figures of three pike, not a dozen.

The pike is a fish of a respectably ancient history. Juvenal, in the Fifth Satire, speaks of what seems to be our *Esox lucius*; in his denunciation of Cryspinus he says, "You must put up with a muddy eel, sister of the slender snake, or with a pike bred in the Tiber, spotted by winter ice, fed with the ordure of the common shore, and used to swim through the drains as far as the Sabruria." That pike thrive in lakes or rivers polluted by sewer refuse is a certain fact. Witness the magnificent stock of these fish in Cumberland Lake, Windsor Park, the water of which receives the effluent of the adjacent sewage farm.

Ausonius also refers to a fish, most probably identical with our pike.

Lucius obscurus ulva lacunas
Obsidet: His nullos mersarum lectus ad usus
Fumat fumosis olido isidore popinis.

The wary luce, midst wreck and rushes hid,
The scourge and terror of the scaly brood,
Unknown at friendship's hospitable board,
Smokes midst the smoky tavern's coarsest food.

In England the pike has, of course, been valued, and, indeed, considered in earlier times as an important gastronomic adjunct. It is recorded that at a feast given by Archbishop Neville to Edward IV., no less than 608 jack formed a considerable part of the banquet, together with porpoises and seals, and Willoughby tells us they were kept in wooden watercoops at Cambridge. Camden also refers to their being caught in the Thames. In his description of Southwark, speaking of the stews and ponds near the river's bank, he says: "They are to feed pike and tenches fat and to scour them from their muddy fennish taste. Here have I seen pike's paunches opened with a knife to show their fatness." Moreover, Blakey informs us that about the close of the thirteenth century jack was so dear that few could afford to eat it. Yarrell says the price was double that of salmon and ten times that of either turbot or cod. In Henry VIII.'s time these fish fetched as much again as house lamb in February, and a very small pickerel was worth more than a fat capon. It is certain, therefore, that his tyrannic majesty was valued considerably above his

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deserts gastronomically, for, unless cooked "brown" after the French style, and that when he is in full season and not too large, I do not think him at all to be compared to a "good capon," much less to house lamb in February. The roe has been supposed to be of a poisonous quality when eaten, but Linnæus avers he saw it dried and made into bread in Lyksele, Lapland, which sufficiently quashes such an idea. Of course, it is possible that, under certain circumstances, such diet might be injurious to an European digestion, but the report was probably based on a solitary instance of derangement, and is, no doubt, of little actual truth.

Really the fish is an agreeable addition to the table of the poor at least, if properly cooked. It may be filleted, and fried, or boiled. The former I prefer. As I am, however, no cook, I must not presume to give directions for its treatment; remembering the old Horatian maxim, *Ne sutor*, &c.

Like every other fish of any importance, the fanciful writers of other days have attributed to the pike medicinal qualities of no mean order. Nobbes says, "His head is very lean and bony, which bones in his head shaped like a cross, some have resembled to things of mysterious consequence. . . . . If these comparisons smell anything of superstition, yet as to physical use these bones may be profitable. For the jaw bone beaten, to *pleurises* and other complaints, some do approve of it as a remedy for the pain in the heart and lungs, others affirm that the small bones pulverised may be fitly used to dry up sores, and many the like medicinal qualities are attributed to the pike head. Another ancient writer writing of his Nature of Things, does discover a stone in the brain of the pike much like unto a crystal. Gesner himself, the great naturalist, testifies that he found in the head of a pike two white stones. . . . . Gesner likewise observes that his heart and gall is very undeniable to cure agues, abate fevers, &c., and that his biting is venomous and hard to be cured." This latter part is certainly true, owing to the triangular shape of the incisions made. Siebald, writing in the reign of Charles II., also refers to what he doubtless thought correct, namely, that the heart of a pike was really efficacious against febrile disorders, and that the gall was of much use for bad eyes. All of these ideas, however, the reader need not to be told are untrue and absurd. Blakey states that in Bohemia it was considered an unlucky omen to witness the plunge of a pike before noon. The Swedish fishermen, according to Yarrell, believe that it turns its head towards the shore on St. Gregory's day, that is, March 12, and that six days later it has approached the beach of the lake it inhabits, near the influx of some stream, where the ice first breaks up. They also say that phases of the moon influences its rapacity, and that its voraciousness increases during the dog days.

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Perhaps angling for pike is the most popular of all fresh-water fishing. The reason for this is not far to seek. The fish is a bold, dashing, voracious creature, and hardly ever derives a lesson from experience; consequently the angler nearly always finds him ready to feed. There is no capriciousness about him—no whimsical peculiarities, as with barbel or carp—no very great variety of bait or food to be successively tried until the proper sort is found—and, to complete the catalogue, the sport he gives when on the hook may be said to be good, owing to his enormous strength and comparative freedom from the sense of pain.

I have referred in the preceding paragraph to the insensibility of the pike to pain. Perhaps, as some interest has been excited in a leading daily journal in connection with this subject, the occasion may be opportune in which to make some remarks anent the subject. That a pike, hooked and even struggling for its life, suffers anything more than a sense of physical discomfort I am prepared to deny. I will give two instances which came under my personal observation, which will perhaps suffice to prove this position better than any selection from the multitude of examples furnished by other writers.

The first occurred on the Thames, near Windsor. Myself and friend were fishing with the gorge hook for pike, and I, having exhausted my store of hooks, was obliged to have recourse to his tackle basket. Having sought one out and duly baited it, I began fishing anew, when presently —bob, bob, a jerk and a shake, proclaimed the run of a no very puny fish. The usual eight minutes were allowed, and I wound up and proceeded to play my fish. He fought gamely, more so than I really expected, because of the gorge hook, and suddenly rearing his head above the water, with one shake of his jaws broke or cut the fine gimp in two. There was no help for it, however, and with a deep-mouthed growl I commenced again. Presently, and before ten minutes had elapsed, it was my friend's turn to announce a run. The legitimate period of waiting was allowed, and he reeled in and repeated with success the playing business, in which I had been so unlucky, and in a few minutes a fine male fish of 7lb. lay on the floor of the punt; from the side of his jaws there protruded the gimp of *two hooks, and that of one had been broken.* I thereupon dissected the fish, and found that the lowermost hook and bait were unquestionably mine, and that the barbs had been securely fixed in the walls of the maw. *Ergo*, the fish could not have suffered pain.

The other incident took place in Windsor Park, on Virginia Water. A party of us had been fishing some time, when, on rounding a bend and gently rowing into a sort of cove which is always a favourite spot for jack, I indicated a spot to one of my friends which *looked* as if it held a fish. Sure enough it did, and he instantly proclaimed it hooked. As he

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was fishing with a gut paternoster (most foolishly), however, the struggle was of not long duration. The pike somehow *cut* the gut—it was not broken—far above the hooks, and his pikeship got away. Of course sympathy was duly exchanged, and we, after trying again ineffectually for the same fish or another, proceeded on our way, and soon lost sight of so ugly a mishap in the capture of a fine five pounder and some good perch. As the evening approached, however, and we proceeded to return to the landing stage whence we had started, it occurred to one of us to try this "pikey" nook again, in the faint hopes of recapturing the breakaway. Curiously enough the first throw of the spinning bait proclaimed a fish hooked. He was duly played and landed, and wound round and round his jaw was the identical paternoster lost in the former part of the day, with *both hooks in the fleshy part of his mouth* at the side. If this fish had suffered pain, as we understand it, would he have regardlessly taken the latter bait with such alacrity, or, indeed, at all? I humbly conceive that the moral of both these incidents is simply that fish do not suffer as has been alleged by so-called humanitarians.

In any case, it amounts to a certainty that the struggling fish on ordinary tackle does not suffer the excruciating agony which is supposed to accrue from the anticipation of capture. The fore-knowledge of death is denied man, unless he can gather it from his surroundings, or is communicated by speech—it is never intuitive. The hooked fish can certainly not reason from cause to effect. It seizes a bait; pain of a slightly discomforting nature warns it of something being abnormal, and it appreciates at once that its movements are not absolutely free. But I conceive that this resistance only heightens the enjoyment of its capture of the bait, which, were it not for the sense of physical discomfort imparted by the presence of the hook to the fish, would be unalloyed whilst it lasted. The hunting spirit is inherently a pleasure in all animals of prey—the pleasure of satisfying hunger—which having been enhanced by its exercise, is its crowning joy. The struggle is not painful, but must be pleasurable, for it is merely an exercise of muscular power, and the exercise of power of any kind is, up to limits dictated by the organism, a pleasure. In man the intelligence, which in some cases foresees a failure to get the object aimed at, becomes hopeless in the strife, and then the strife becomes pain. With the athlete, racing, walking, jumping, or wrestling, the *finis coronat opus* is before him. Take away the crowning hope, and the struggle is slavery, and slavery is, to a fine intelligence witnessing the extent of the failure, excruciating torture. Suppose, however, the crown possible of being won, then contest is a natural pleasure, which shows itself throughout animate creation. Thus is it with the hooked fish. We have seen that the pliant rod and fine steel hook can cause but little inconvenience

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—in fact, it simply stimulates the zest in the antagonism at work. The fish, especially pike, with a minimum of nerve material, anticipates no untoward ending, and, until its vital force is exhausted, it is not discommoded, and even then its condition seems to me to be more that of a wearied contestant than of a combatant hopelessly struggling against superior force, yet tortured with a full sight of his inevitable doom. Indeed, I am inclined to the belief that, as the pain of the hook wound is almost *nil*, the pike enjoys the fight, *per se*, recognising nothing behind or before, above or below, the combat.

The whole fallacy which condemns fishing as cruel consists in an ignorance of the vast distinction and difference between fish and some other objects of sport.

It would be uninteresting and, indeed, superfluous, for me to detail at this place each device and style of angling for this fish. This will be done fully in the section specially referring to tackle. I shall therefore briefly "note" the various baits, appliances, &c., giving such hints as my own experience may suggest.

The chief of all baits for the pike, undoubtedly, is the dace. I think no one will controvert this statement; and it is curious to observe, in the experience of the constant jack fisher, what a number of his largest fish are taken with this beautiful little fish. Falstaff, after dismissing his army from his presence, notices the fact in a tirade (*solus*) against Justice Shallow, who was intended, it is well known, as a caricature of Sir Thomas Lucy, of Charlcote, whose coat of arms contained three white luces. Shakspeare concludes with the words, "If the young dace be a bait for the old pike, I see no reason in the law of nature but I may snap him." I am very fond of a gudgeon for trolling, and still more so of a young barbel for spinning, because of its extreme toughness; a roach makes a good live bait, and a gold-fish (*Cyprinus auratus*) is caviare to pike in some localities. Before all, however, I adhere to the dace, and, from careful observation and comparison, I am convinced that the pike shares my opinion. A clean well-conditioned dace is a lively strong fish, and, whether live-baiting or trolling, it resists the deteriorating effects of the stream far longer than any other fish except small barbel. That, at, least, is my experience. Smelts are said to produce a delicate flavour when pike are fatted on them. The Medway pike, certainly, in point of flavour, are very superior to those of the Thames.

The pike being a fish adapted especially for seizing its prey from below, the only style of fishing available must be that in which the bait is either suspended as in live-baiting or traverses the water as in spinning or trolling. I confess I believe it possible for a jack to take a

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bait from the bottom, although some authors contend it is impossible, from the position of the creature's eyes and the slope of its jwas. Their argument is good, but the stern logic of facts is better in deciding the point. I have had a jack pick up the gorge hook, and it is well known that at Hendon the invariable practice is to fish live-baiting with a leger. Indeed, on speaking to a friend, who is an excellent fisherman, about the matter, he assured me that *he always* fished with his bait on the bottom in deep water in preference to the usual orthodox plan. The usual methods of angling for pike are trolling, spinning, and live-baiting and fly-fishing.

The art of trolling with a gorge hook has an ancient history, and seems to have been more highly respected in past times than any other species of arrangement for taking pike. Although we have no means of knowing if the ancients practised it for the capture of this parti-colour fish, the form of angling is described by Oppian in lines which have been translated with considerable vigour as follows:

> He holds the labrax, and beneath his head
> Adjusts with care an oblong shape of lead,
> Named from its form a dolphin; plumbed with this
> The bait shoots headlong through the blue abyss.
> The bright decoy a living creature seems,
> As now on this side, now on that, it gleams,
> Till some dark form across its passage flit,
> Pouches the wire, and finds the biter bit.

A considerable quantity of hooks, dug out of the ruins of Pompeii (now in the museum at Naples), are thus described: "Some of them are double backed, others are fixed back to back and fastened to wire, as in the modern gorge hook. Some of the larger of these are leaded, *the lead being conico-cylindrical in shape*, and named dolphin, after a certain resemblance to that fish." Clearly this is the kind of hook referred to by Oppian.

Trolling, or, as formerly spelt, "trowling"—from the French *troler*, to lead about—is generally supposed to have been originated by Nobbes, and in consequence the *sobriquet* of "Father of Trollers" has been attached to his name. In the sense of an inventor this appellation is not just, and, indeed, is indirectly repudiated by Nobbes himself. In the preface to his book he ascribes all his skill as a troller to the tuition of the "Right Worshipful James Tryon, Esq., of Bullwick, Northamptonshire," and in addressing the "ingenious reader" he adds: "I confess I have not had that experience in the art which many have that have made it their business for the space of several years, and I but a *late pretender*." Nobbes wrote in 1682, and is unquestionably the first writer who goes into trolling exhaustively.

To prove, however, that trolling is really of more ancient origin in England, I may refer to the "Booke of Leonard Mascal" (which by the

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way, as I have before stated, is little better than a copy of the "Boke of St. Albans"), which work first appeared in 1590. He says: "The pike is a common devourer of most fish when he commeth, for toe take him ye shall doe thus: Take a codling hook, well armyed wyth wyre; then take a small roche or gogin, or else a frog alive or a fresh hearing, and put through your armed wyre with your hooke on the end, and let your hooke rest in the mouthe of your bayte and out at the tayle thereof; and then put your line thereto, and draw it up and down the water or pool, and if he see it hee will take it in haste. Let him go with it awhile, and then strike and holde, and soe tyre him in the water." This is probably the earliest mention of trolling in the English language.

In the next century, Androvaldus (1613), in his "De Piscibus et Cetis," quotes and explains a passage from Gesner, which runs as follows: "Sunt qui gobiones fluviatiles hamis in serant ad niascandos lucios. Apud anglos capauntur ranis et pisciculis quas blecus nominant officis hamo, trabende fumen per ripam, non statim extralunt sed gain fatigati"—which may be freely translated as follows: "Some anglers use the river gudgeon as a bait for pike. In England they are taken with frogs and with a small fish called the bleak, which is fixed on the hook, and which the angler, stationed on the bank, draws through the water. The pike is not pulled out at once, but played till exhausted." The explanation that Aldrovaldus gives in quoting this is to the effect that the hook should be double and its shank quoted with lead, gland-shaped. "The object," he adds, "of this is not only to sink the bait, but to aid the angler to make a sound when it is pitched in, as of a frog leaping in the water."

The next writer, in point of date, who speaks at all impartially on the subject of trolling is Col. Venables, in 1662. His "Experienced Angler" contains the following passage: "The best way is to trowle for a pike, which is very delightful. . . . Let your line be silk at least two yards next the hook, and the rest of strong shoemaker's thread; your hook double and strongly armed with wire for above a foot; then with a probe or needle you must draw the wire in at the fish's mouth and out at the tail, so that the hook may lie in the mouth of the fish and both the points on either side. Upon the shank of the hook fasten some lead very smooth, that it go into the fish's mouth and sink her with the head downward, as though she had been playing on the top of the water and were returning to the bottom. Your hook once baited, you must tie the tail of the fish close and fast to the wire." Then follow directions it is unnecessary to quote.

Again, previous to Nobbes, quaint old Barker refers to trolling, but does not give directions. In the "Art of Angling," 1651, he says: "One

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of my name, now the best trowler for pike in the realm, he laid a wager that he would take a pike of four feet long within the space of one month with his trolling rod. So he trowld three and od days, and took a great many pikes nigh the length, till within the space of three days from the time, then he took one and won the wager."

Next in order of date comes our friend Nobbes. The trolling hook of Nobbes is noticeable as being, with but little alteration, identical in shape with the most popular form in modern use. The engraving which is published in his book is before me now, and, to use the words of the author of the "Book of the Pike," have "remarkable similitude to the tail of the dragon which St. George has been represented as transfixing for so many centuries"—in truth, the cut is coarse and the hook ill-made, but it is possessed of no wire shank, which many makers even now imagine necessary to retain the shape of the bait, but which I unhesitatingly affirm is unnecessary and, indeed, absurd. There are many works following after that of Nobbes, which more or less refer to trolling, but I forbear quotation, as my only object is to trace its history and show my readers the esteem in which the method has been held. Amongst others may be mentioned "Chatham's Vade Mecum," 1681; "Blower's Gentleman's Recreation," 1686, and the "True Art of Angling," 1696. From the latest of these dates to the present time, trolling has come in for a vast share of popularity, a most curious work, entitled "The Innocent Epicure," 1697, treats of trolling with a poetical flourish of trumpets, which is exquisitely funny.

Go on, my muse, let next thy number speak,
That mighty Nimrod of the streams, the pike.
Oh! angler, here much caution use and care,
If once thy bait be gorge, alas! beware.
Thy rod, thy lines, thy hooks are all too small—
The tyrant's strong, and rudely forces all.
A stiff, neat, nine-foot role you must prepare,
Which may in several things repay your care.
* * * * *
A dace, a gudgeon, or a stone loach take,
Or, wanting these, some happy trial make
Of something else of the less usual kind.
* * * * *
Baited like this, you need not fear your prize,
True glutton-like, his stomach rules his eyes.

The opening exhortation to the Muse to *go on* is very happy. The poet's "divine afflatus" is but badly regulated in the poem. At times he sports on Parnassus, and lights, lobworms, Venus and her doves, gentles, greaves and garbage are alternately food, as Artemus Ward would say, for "his too too poetic soul."

Another poet, John Whitney, close on the eighteenth century, also broke forth into jubilant singing anent trolling, thus—

First from the brook I take
A gudgeon, roach, or chevin for my bait,

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Which suddenly I then impail
Upon my hooke, and fixing, tie his tail.
My hooke, well armed with wyre strong,
And commonly eight-inches long,
I to my swivel fix . . . . . .
Just to the brim retrieve the sinking roach
With gentle stirring, then he will approach
With eager haste to taste the loved prey;
Then give him line, and let the reel so be
From knots and snarls exceeding free,
He'll quickly drown himself in his debauchery.

This work is undoubtedly exceedingly rare.

Another poem follows still, and deserves a word of commendation. Its title is the "Angler's Eight Dialogues in Verse," by Scott, 1758, and in the seventh dialogue, on trolling for pike, the following passage occurs:

The pike, my joy of all the scaly shoal,
And of all fishing instruments—the trowl.
My bounding heart against my bosom beats
Now while my tongue the glorious strife repeats.
Oh! when he feels my jerking hook, with power
And rage he bounces from his weedy bower.
He traverses the stream with strong career,
With straightened string his maddened course to steer.
He springs above the wave at length, o'ercome;
This evening shall he feast my cheerful home.

This is certainly above the average of angling poetry, and as a concluding specimen of still better poetry upon the subject of "Trolling" I may be allowed to quote "Some Verses on Trolling,' by W. Watt, 1839, which display real vigour and power. The verses are reported to be a fragment.

The pool is reached—near to the farther shore,
Through an old weir, the rapid waters pour;
But deeply inward, where the troller goes,
They're circled back and lie in calm repose.
Brood beds of rushes fringe the silent tide,
And leaves expansive float upon the side,
With here and there a goodly space between,
Where the bright bait may enter and be seen.
Stand back, my friends—our first attempt be made
Here, where the wave is slumbering in the shade.
Behind these flags I'll hide me as I go,
Lest jack or pike refuse the bait I throw.
He lets the butt upon his side recline,
In his left hand detains some slackened line;
Lowers the rod, and then with gentle sweep
Urges the tempting gudgeon to the deep.
The tempting gudgeon to the bottom flies,
And right and left the troller bids it rise;
Curling and spinning, like a fish at play,
Its glittering form attracts the watchful prey.
Lo! as the bait is near the surface led,
A powerful pike forsakes his weedy bed,
With sudden grasp obtains the yielding snare,
Then turns to pouch it in his watery lair.
And at last,
Borne to the top, his jaws distained with blood,
Still floundering on he beats the foamy flood—
Like some bold warrior, though his doom be cast,
Wounded and faint, he struggles to the last.

I am not disposed to place trolling as at all equal to spinning in any one quality. It is eminently useful where there are many weeds, and is very killing; but your fish is exhausted by the time he has pouched the lead-bound hook, and can give but little sport. The rod required

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should be a stiffer one than that used for spinning, and I always throw off one of Wells' spring winches, using a fine undressed silk plait line. I like a trace with one swivel, and the following is my method of baiting: After selecting a bait to suit the size of the gorge hook, I pass the bait on in the usual manner, turning the hooks up over the eyes (the hooks should not be too "rank"), and, after cutting off one pectoral and one anal fin, instead of tying the tail with thread, the needle is passed through the hard vertebra of the tail, and a sort of half knot made with the gimp. This is Mr. Pennell's style, and an exceedingly ingenious one it is, and will be hereafter shown. The bait cannot curl up, and if the tail be cut off close no resistance is offered to its passage through the weeds. In making the bait it is necessary to bear in mind that the jack always, or nearly so, seizes it when it is being drawn up through the water, not as it "shoots headlong through the blue abyss;" and therefore it is advisable to draw in slowly and carefully, with as much variety in movement as possible. Give the fish from five to ten minutes for pouching, and then draw in—do not strike—and the pike is yours. In saying "do not strike" I am aware I am differing from many standard authorities on the subject, but this is the result of a physical fact, and is not a matter of opinion. Immediately the fish has pouched your bait the maw closes tightly round it, and therefore the hooks, by the weight alone of the fish, are firmly embedded in the surrounding membrane. To strike is to run the risk of tearing out maw, hooks, and all, which I have repeatedly done in the days of my angling apprenticeship.

Of late years, throwing from the reel has been greatly in favour in pike fishing, and as I consider it a cleanly and exceedingly convenient method of getting out a bait of whatever character, a few words about it may here prove acceptable.

The fine and far off system of Nottingham fishing, in which a running line and tackle generally adapted for fishing at a long distance from the bait was used, brought into use wooden wheels of large drum, which, because of the desirability of rapid manipulation and celerity, gradually but surely developed into quite a work of art, which fulfils its purpose almost to perfection. As the frequent lightness and use of the undressed line rendered the ordinary drawing of it from the reel impossible for the cast, the movable axis of the wheel and its fittings were made so light as to run sufficiently rapidly to allow of a cast with moderate weight connected equal in extent to these by the ordinary method. All the angler has to do now, therefore, is to use an undressed line, and defying wind, rain, frost, and other obstructions in the shape of awkward feet and legs, bits of wood, branches, &c., which encumber one usually when throwing

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from the bank, to make himself happy with as neat and effective a piece of tackle as it is in the power of human mechanism to bestow. In fact, the precision with which one can make a cast, and the beauty which can be imparted to the spin and career of the bait (from a fishy point of view), or to the erratic movement of the gorge bait, are invariably superior to those of the old style—that is of course when you know how.

A moment's reflection will convince the reader of the truth of these assertions. If one be fishing from the shore—decidedly the best "coign of vantage" if practicable when jack fishing—this shore is ever uneven and strewn with varied *debris*; whilst probably twigs and short undergrowth add to the perplexity of the angler, it being imperative that he coil his line upon it before casting. If a boat be used, and the till of the punt afford a plain and clear surface for the coiling referred to, a puff of wind will destroy the advantage, and the tread of a heavy foot will sever the line or so weaken it as to practically sever it, or somebody's leg will be awkwardly in the way. From there being no unwinding and coiling in the Nottingham style, all this annoyance when it is used is *nil*. The bait is delivered cleanly, and is wound up as it is withdrawn; and this is how it is done:

The bait should be (according to the leads thereto attached, less or more some few inches) about six feet from the top of the rod, supposing that the rod of course be about twelve feet. The rod is then thus taken: the right hand embraces it below the reel, allowing the forefinger to act as brake upon the periphery when it revolves. The other hand lightly clasps the rod some eighteen inches higher up. To make the cast of course first "sight" the spot whereto it is desired to send the bait. Turn almost right or left about, and then with a swiftly increasing impulse of the rod, bring it and yourself round pointing to and facing the destination of the bait. If this be skilfully done the bait will assuredly fly with a graceful flight whither it is required, and as it nears the place the forefinger of the right hand should gradually apply the restraining power; not suddenly, or back will come the bait into the thrower's face perhaps, but with precision and coolness, not hurrying or fussing about it. Having thus delivered the bait, the butt of the rod which, according to convenience, did or did not rest upon the angler's hip, must now do so. The grasp of the left hand is tightened, and the right winds in; of course as in the old fashioned method, the pace of the bait can and should be varied as much as possible.

Spinning is commonly included under the head of trolling, but not properly so, for the "trowling" of Nobbes was entirely with the gorge hook. I find great difficulty in explaining in writing the manipulations of an almost entirely mechanical art. But by once or twice watching the operations of a good spinner, more niceties could be understood than by

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reading volumes on the subject. Spinning is analogous to fly fishing, and in casting your bait, judging of depths, and allowing for eddies, as well as in striking the fish, there are peculiarities which are acquired only by experience or judicious instructions, accompanied by practical demonstration. This is undoubtedly the most artistic style of jack fishing, and as such it has been the subject of considerable attention. It is questionable whether any improvement has been made in the form of the old-fashioned flight of hooks, except in the reduction of the size of each triplet. Mr. Pennell has certainly very ably advocated his particular variation, but I question the merits of the arrangement. It will, however, receive attention in the section devoted to Tackle. The well-made flight, and the skilful angler to arrange it, are unapproachable in jack fishing. The different styles of tackles will be seen further on.

The same difficulty which arises in explaining spinning presents itself when speaking of live baiting. This kind of pike fishing is very much in vogue amongst some of our most successful of anglers. It is not necessary that I should detail its various forms. I shall here content myself with giving my readers my own special method. The ordinary live-bait tackle is somewhat as follows: A double hook, a gimp trace, with weight attached, and a stout cork float. Usually this weight is for the purpose of cocking the float and keeping the bait about mid-water. Now, I vary this by adding a bullet or large leger to the line nearest the rod, so that the float is upside down, and the connecting line between piscator and his bait is sunk in the water, leaving the bait free to swim in a complete circle without danger of entanglement. For deep or rapid streams I attach great value to the leger paternoster, such as is used at the Welsh Harp water continually.

While I am on the subject I may describe a very useful kind of bait-can I designed some years ago, and have constantly used with success since. It consists of an outside metal receiver in the form of a small pail, with a handle of course. Another receiver, which is made of wire, net, or tin perforated with holes, fits closely in the former, and this is also fitted with handles and a cover. The baits are placed in this, and water is poured in. All one has to do when a bait is required, is to lift the inner receptacle, and, without wetting the hand, select such as is deemed fitting; or when fishing by a stream, instead of immersing the whole of the can in the ordinary manner, the inside receiver is lifted from the outer, and is stood in the stream, the bait getting the advantage of completely fresh and ever-changing water.

Trolling, spinning, or fishing with a live or dead fish generally, has not always been thought so much of as it is now. I have before me a quaint old poem, inserted by Llewellyn in his "Men Miracles" (1646), which is

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eminently satirical on this kind of fishing. I cannot forbear to give a part of it:

He that searches pools and dikes,
Halters jacks, and strangles pikes,
Let him know, though he think he wise is
'Tis not a sport, but an assizes.
Fish to hook, were the case disputed,
Are not took, but executed.
Break thy rod about thy noddle,
Throw thy worms and flies by the pottle,
Keep thy cork to stop thy pottle,
Make straight thy hook, be not afeered
To shave his beard.
That in case of started stitches,
Hook and line may mend thy breeches.
* * * * * *
* * * * * *
Hooks and lines of larger sizes,
Souch as the tyrant that troules devises,
Fishers nere believe his fable—
What he calls a line is a cable.
That's a knave of endless rancour
Who for a hook doth cast an anchor.
Break thy rod, &c., &c.

But of all men, he is the cheater
Who with small fish takes up the greater.
He makes carps without all dudgeon,
Makes a Jonas of a gudgeon.
Cruell man that stayes on gavell,
Fish that great with fish doth travell.
Break thy rod, &c., &c.

A fly is sometimes used for pike, but with indifferent success. It should be a brilliant gaudy piece of workmanship, and as unlike anything in nature as possible; at least, pike seem to take it best when it is so. I remember being out with a friend at a pike lake, three miles from the nearest town, when our baits failed us. We had no roach tackle, only that for pike; no artificial bait; nothing but an old red flannel nightcap in my friend's bag, and a few gimp double hooks and traces, and some mixed silk for whipping, in case of an accident, in mine. My friend suggested hanging the whisky-flask on our hooks; a German sausage was next seriously proffered. I am afraid the latter would have succumbed in slices (Blakey speaks of catching pike with bacon), but a "happy thought" flashed across my mind. I seized the aforesaid nightcap, and, tearing off a shred, it was soon lashed on the shank of a double hook. Next I searched for a feather, and finding a pigeon's and a partridge wing feather almost side by side beneath the neighbouring oak trees, I whipped them on as well. Was there anything in nature like this fly? My friend roared with laughter as I attached a light spinning trace. "Let those laugh who lose," said I; "those who win are sure to do so;" as I essayed to throw this comical mockery of a fly. Well, reader, the result was four brace of jack, one of the fish weighed nearly 12lb. I find that for proper jack fly fishing it is advisable to use light tackle; and the best results are obtained from localities where the weeds almost reach the surface of the water. Autumn is the best season of the year. The motion imparted to the fly is a sort of spasmodic skip.

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The live frog during early summer is a useful bait, but requires careful usage. I have found it very productive in brilliant weather, when the pike are lazy and somnolent. The angler should use a stiff short rod, and tackle as fine as possible.

The frog should be hooked as lightly as can be through the skin of the back to occasion the least torture possible. For dead-frog fishing use a gorge hook and pass the baiting needle in at the mouth, through the frog, and out at the hind part; tie the hind legs to the wire of the gorge hook, and use it the same as ordinary gorge bait. The yellow frogs are the best.

I usually try to hide myself in the boughs of a willow or some such overhanging tree, dropping the bait gently down to where the pike probably lies. If a great chub should smack its mouth over the toothsome morsel, let not the tyro be surprised. This is a killing bait for chub in early season, as before noted. The end of a calf's tail tied on a double hook, and large green beads for eyes, is also a most admirable bait for pike. Another excellent and most durable bait is as follows: Get a small eel, cut off the head, leaving about 1in. of neck attached; cut off 3½in. of tail, dissect back the skin a little way at the head end, and cut away a little of the flesh as far as dissected. By then drawing over the dissected skin as it was, the head end forms a socket, into which insert the tail, and fasten both with a few stitches through. Use on a large spinning flight. The bait should be kept in spirits of wine or dry salt, and as it cannot be torn will last a very long time. This bait presents a most attractive appearance when spinning in the water, and is very killing.

Of the various trimmers and poaching snares I shall offer no description at this time. A chapter at the end of the volume describes the "black arts" of fishing in full. Many of them are too well known, unhappily, although poaching is on the decrease. The angler who may have the elements only of fish capture in his mind is quite good enough in the "craft" to catch pike, fairly fishing. Observation and tact are alone sufficient to perfect him, and the fish on which he should aim constantly to exercise these faculties should be *Esox lucius*—the pike, the tyrant of the watery kingdoms, the remorseless, resolute, voracious creature, over whose cavernous jaws Nature has written, for the benefit of the small fry, in language unmistakable to them, an epigraph as forcible as that the author of the "Divinia Commedia" saw inscribed over the portals of hell.

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CHAPTER XXIII.

THE SALMON.

I NOW approach the great autocrat of fresh water, the so-called lordly salmon (*Salmo salar*). So much has been written upon this fish by recent ichthyologists that it would be presumptuous on my part to attempt to add new and original information, or to greatly modify what has been so ably laid down as law by our chief salmon-fishers. I shall, therefore, content myself with an outline of the fish's history, and the methods of capture, attended by such remarks as naturally suggest themselves.

The salmon heads the list of British migratory fishes, of which the other members are the grey or bull trout (*Salmo eriox*) and the sea or salmon trout (*Salmo trutta*). By this I, of course, mean fishes descending to the sea periodically for whatsoever purposes.

Notwithstanding the present fame of this king of fresh fishes, its history is not very ancient. The nations of old were chiefly concerned with the products of the eastern parts of the earth, and to them the *Salmo salar* was a stranger. The Greeks knew nothing of it, and it is scarcely recognised even by the Roman writers; it is fair, therefore, to assume that even the fish eating gourmands of the seven-hilled city did not esteem it. Pliny mentions it (B. 9, C. 32), but then what object of natural history of any consequence at all does not this intellectual observer notice? He, however, only refers to it as being esteemed by the people of Aquitania, in Gaul. Many of his countrymen must, nevertheless, have been acquainted with it in the rivers of Britain, where they had been peacefully settled from a distant date. Ansonius, in his characteristic poem on the Moselle, is the only other writer that speaks of it, so far, at least, as my reading enables me to say, and I have made diligent search; and from him we find that the people were aware of distinctions which separate some species of the same family, especially between the *salmo* and a species he terms the *salar*, although

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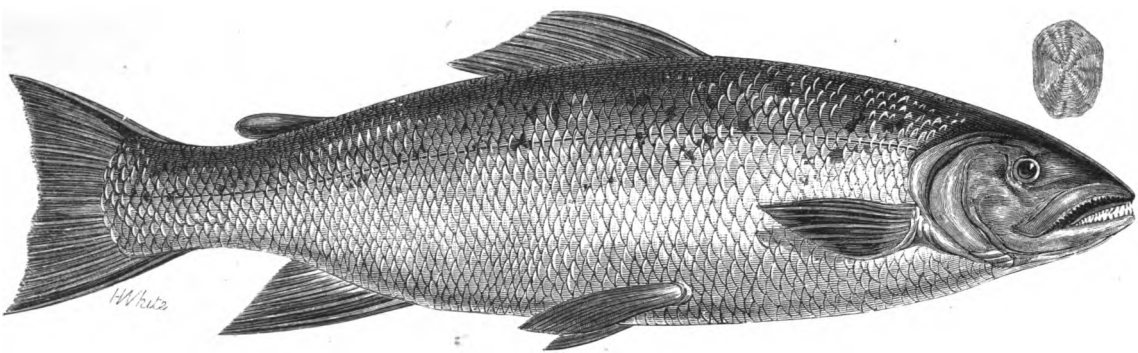

THE SALMON—(*Salmo salar*).

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modern writers have chosen to consider the names as applied to the same fish. According to Couch, the ancient British name is given in an MS. in the Cotton Library as *Ehoe*, as also by Pryce, in Cornwall, and Pennant, on the authority of Richard Morris, Esq., Gleissiedyn, Eog, and Maran; but, although not British, the modern designation is not derived from a Greek or Roman root, and will rather be found in the name of the river Salmona, which passes into the Moselle, where this fish was found in abundance, and whence, perhaps, the name was brought into our country by men who had been acquainted with the salmon in both these regions.

It seems probable that either the sea trout or the peel is the salar of the poet. Couch also says: "We believe that a figure of the salmon will be found stamped on some Samian or ancient Roman pottery, as represented in the 'Intellectual Observer' for November, 1864, where even the young is shown with the bag of the egg attached at the throat —no small proof that there were some in remote times who studied these things." It is clear, therefore, that the Romans of ancient nations alone knew of the salmon.

It is equally clear that whether in a fresh or salt state it has been always an article of considerable importance, at least in Britain. In the fourteenth century we are informed, in the Life of Thomas A'Kempis, that the love of that pious writer for the Book of Psalms was compared by his brother monks to their love for salmon, and the writer adds, "it is an exceedingly delicious fish." That in some places it was scarce and bore a high price, and was a subject of complaint in the fiftieth year of Edward III., appears from a petition presented to the Crown, which prayed that, "whereas the salmon and other fish in the Thames were taken and destroyed by engines placed to catch the fry, which fry was then used for feeding pigs, a law might be passed to take up all the trunks between London and the sea, and that the river guardians suffer no net but of large mesh." The petition, which is in French, thus ends: "awaiting which, most redoubtable Lord, if it shall please your Highness then to make order for the next three years, all your people repairing to London or bordering the river shall buy as good a salmon for two shillings as they now get for ten." ("Notes and Queries," 1855).

Notwithstanding the preceding, it appears from "Heraldry of Fish," that in remote times an offering of fish had been allowed, and was for several centuries claimed and allowed to the Abbot of St. Peter's in Westminster, on the plea that when St. Peter consecrated that church he made a grant to the convent of a tithe of all the salmon caught in the Thames under the Lord Mayor's jurisdiction, which is from Yantlett Creek to the stone near Staines Bridge. To a failure of this tribute has

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been attributed the decay of salmon in the Thames. An analogous reason for the decrease of salmon in Ireland was given by Dr. Boute in his "Natural History" of that country. He says that before the Revolution in 1688, to which the author ascribes all the national calamities, salmon were plentiful and cheap. Shakespeare mentions the fish in Othello in such a way as to infer its fashionableness.

The laws made in reference to this fish are the true index to its estimation as an article of trade. They appear to have been of such a nature as to show that the fish was recognised as merchandise of a profitable kind. As a matter of curiosity it may be worth while to glance at some of the quaintest of the clauses referred to. In the year 1423, the second Act of Henry VI., it is ordered that the "buttes of salmon comying be wey of merchandise into this land out of strange countries should be of certain mesure." In the twenty-second Ed. IV., in which the right of fishing in the Tweed is let on form to the merchants and freemen of Berwick; the packing of salmon in barrels was also regulated.

Magna Charta has two clauses affecting salmon, one putting a stop to the further "defending" or appropriation of fisheries by the Crown or its grantees, and the other prohibiting all weirs or "curries," except only by the sea coast. Other laws affecting the close time, and variously regulating the salmon industry, were afterwards made as occasion seemed to dictate for both public and private interests, but until 1681 it appears that the close times of several of the most productive English rivers were regulated by the Acts of Richard II., which had nominally been in force, therefore, for 500 years. With the subsequent multitude of Acts affecting our home fisheries it is not here necessary to deal.

In Scotland legislation began almost as soon, and proceeded with objects identical with those of Ireland and England. The commencement of Scotch salmon law began under the governance of Robert the Bruce, and, according to Alexander Russell, occupied "an incredible share of the attention of the Parliaments of his successors for several hundred years; so that in reading the collection of ancient Scottish statutes one is apt to think that the chief thing which Scotland achieved on the field of Bannockburn was 'Acts anent the preservation of salmonde.'" These statutes for the preservation of the "reid fische," as it was termed, are admirable in spirit, and exhibit all the thoroughness and severity of the Scotch character when dealing with matters whereby money accrues. Over and over again the reason given for an enactment is the praiseworthy one, because such practices—*i.e.*, engines of destruction, &c., "destroy the breed of fish and limit the commonn profite of the realme." The penalties attached to the violation of these laws is as remarkable as their

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number. One of the first Parliaments of James I. (Scotland), 1424, thus records: "Quha sa ever be convict of slauchter of salmonde in time forbidden be the law he sall pay fourtie shillings for the unlaw, and at the third time gif he be convict of sik trespass he sall tyne his life or then bye it," which in modern English means that he shall lose his life or *buy* it—strangely enough, for how much is not specified. Probably the price was regulated by the circumstances of the culprit and the mercy of the "powers that be." This severity is very common throughout the whole of ancient Scotch legislation of the "salmonde," and in only one instance can I find any relaxation—it is the 9th James I., 1429. "Out-takand," that is, excepting from the other Acts regarding salmon, "the waters of Solway and Tweede quhilk sal be reddie to all Scottis-men all times of the year as lang as Berwick and Roxburgh ar in the English mennis hands." That is to say, as the authority before quoted naively remarks, "the Scottish King and his Estates solemnly passed an act authorising and enjoining all Scottis-men to go a-poaching in England and in those portions of the border waters in which, though properly Scotch, the English had, or occasionally took an interest." Pleasing this to Englishmen! Moreover, not only were Scottis-men empowered to take English salmon, but if Englishmen wanted Scotch salmon, then "it is ordained that na Scottis-man sell to Englishmen and in England, beforehand or otherwas, ony salmonde lot, that Englishmen bye them in Scotland for English gold, and none other contentation; and gif the Englishmen will not bye them, the Scottis merchandes may sende them in Flanders or other places quhair them thinkis; swa that of was wise, they nouther sende them nor sell them in England." What do my readers think of this piece of protectionist policy?

A curious mingling of things holy, and spiritual, and fishy, and worldly, next attracts our attention in the Scotch legislation of "Salmonde," after the Reformation. "Acts anent the trew and holy kirk, and them that are declared not to be of the samin (same);" "Discharge of labouring of Sabbath dayes, or playing or drinking in time of the sermon;" "Anent the Zouth and uthers beyond sea suspected to have declined frae treu religion," and so on, interspersed themselves with charming variety amidst the ever-increasing legion of Salmon Acts. The result, it must be, however, confessed, of such persistence and painstaking, particularly in the end, is that Scotland has remarkably preserved her fisheries from a decay which is England's shame on her salmon weirs. I cannot find space to follow up a consideration of the subject, but a perusal of Alexander Russel's excellent treatise on "Salmon" will enlighten the curious who are anxious to explore the mighty labyrinth of salmon law.

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The following are some of the dialectical names by which the *salmo salar* is, or has been, known: Baggit, beikat, bluecap, bluepoll, brandling, brandlin, chine, cudding, ehoe, farthing trout, fingerling, finnack, fork-tail, gravelin, gravelling, gibfish, gilse, grilse, grilse-kelt, gowries, half-fish, heppar, kelt, kepper-grilse, kilty, kipper, laspring, lax, lewin, ligger, parr, pink, pug, rawner, salmon, salmon-peal, salmon-sprint, samlet, sewen, silver salmon, simen, skeggar, skirling, smelt, smolt, smoot, sparling, sprag, sprod, summer cock, and trotter.

This list is from a glossary of fish names which the Dialect Society contemplate publishing, under the editorship of Mr. Satchell, of Hampstead.

I shall now, for the convenience of myself as well as the reader, proceed to trace the history of the salmon from the deposition of the ova, through its parrhood, smolthood, and grilsehood, on to the period when it falls to the fisherman an adult fish.

First as to the ova. It is expedient to say that during early or late spring the salmon commence to leave the estuaries of the rivers and ascend for the purpose of depositing the eggs. These salmon are usually at this time in the pink of condition, and are known as "clean-run" fish. They have obtained an increase of size and quality by their preceding residence in salt water, which on some occasions has amounted to as much as from 5lb. to 9lb. in a single journey.

In selecting a river for ascension, it is a noticeable fact that salmon seldom make a mistake as to whether it is that in which they passed the early stages of their existence or not. It would seem as if either the temperature or complexion, or some other quality in the water flowing from the native stream of the salmon, was easily perceptible to it, for with a homing instinct which is also observable in animals higher in the scale of organisation, it unerringly determines to ascend to the haunts of its parrhood for the accomplishment of its mission—the Divine edict, "increase and multiply." However this be, it is an indisputable fact that smolts which in the year preceding have been taken, marked, and returned to the water, have been taken, in repeated cases, during the ensuing season, exhibiting the astonishing increase alluded to. The order of the ascent of these clean-run parent fish seems to be, first, salmon, or the strong early runners; then the grilse; and, lastly, the small "spring salmon," which have probably never before ascended, but for a period of from eight to ten months remained in the sea gathering size and strength, and conceiving ova for the first deposit in its history. It may be useful at this stage to explain what I had almost forgotten, namely, that the parr usually puts on a "smolt dress," by which is meant a slightly different colouring.

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and increased thickness of skin and scales, in about three years after hatching, and usually descends to the sea during May or June, or even July. It is usually, also, about 2oz. at the time of its migration, and may, as before indicated, and often does, return in the following spring, with enormously increased bulk. If they return in this manner they are known as *grilse*; if, however, as may happen, they remain longer in salt water, and do not seek the rivers till the next year, they are *salmon*. From what has been said, it will rightly be assumed that it is not absolutely a physical necessity on the part of the fish to spawn every year. In fact, it is an established truth that they sometimes only do this in alternate years. Especially is this the case with young fish. As regards the weight of parr I may remark that when this chapter appeared in "The Bazaar," the Editor of that paper stated that early in September, 1879, whilst trout fishing in the Dart, he caught a parr, weighing close upon ¼lb. He added: "This was the largest we ever saw; indeed, in the same river we have frequently taken smolts which were much smaller."

At the time of ascent into the spawning water the fish—whether grilse or salmon—is of a beautiful silvery hue, merging into bluish-black on the back and upper part of the head. A few dark spots are observable, and the *tout ensemble* of the *Salmo salar* at such time is very imposing—not at any time so variously beautiful, in my opinion, however, as the Thames trout in his full war paint. The method by which one can tell if the fish taken at this period be a grilse or salmon is by no means easy of verbal communication; but their scales are easier of detachment than those of their older brethren, and superlatively easier to get off than those of the small spring salmon before noticed. The tails of the two former are also less forked than those of the latter.

The journey upwards is often one of great fatigue and difficulty, which, however, the instinct of the salmon in a great majority of cases surmounts. The physical preparation received in the salt water is fully required, and the maturing of the ova and milt, together with the arduous character of the journey, tax the strength of the fish to an extremity. No impediment, however, seems to daunt the aspiring would-be parent, and she or he shoots with the velocity of a lightning flash up cataracts or rapid streams, and over mechanical hindrances with a steeplechasing ability often perfectly wonderful. Mr. Pennell says that at such times the salmon will glide through the water at the rate of 1500ft. per minute —upwards of 400 miles per diem, assuming it never rests. I am quite inclined to think that this is not an overestimated calculation, as it accords very nearly with my own results in reference to trout when alarmed, allowing for the difference in muscular power between the *Salmo salar* and *fario*.

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Wondrous have been the stories told of the salmon leaps. The old idea was, of course, that when a fish foresaw a difficulty in reaching the upper water of a cataract, it curved itself like a bow, and placing its tail in its mouth, hurled itself as a spring thus bent held between the finger and thumb propels itself through the air. And this not once, but many times in succession, until its object was attained. Of course the idea is untenable, for the question would naturally arise, How does the fish get into position, taking into consideration the tumultuous water from which it springs?

To this self put question, I may answer by quoting the capital explanation of the whole *modus*, which I may here observe is as applicable to a Thames trout, a pike, or a barbel in their occasional leaps, as to the salmon in full vigour seeking to surmount some miniature cataract or weir. Speaking in 1850, Ephemera says: "Last year I paid particular attention to their points, and saw that salmon surmounting obstacles in their way as they ascended rivers sprang straight forwards head foremost out of the water, which, with accompanying muscular effort, sent them upwards and forwards. If a salmon means to sink to the bottom it strikes its fins, particularly the dorsal one against the water above. The action of the fins against the resistance offered by the volume of water above tends to force the fish downwards; on the contrary, when the fins are strongly pressed against the volume of water beneath the fish, the tendency of the pressure will be to propel the fish in a vertical direction, or upwards. The class of fish denominated cetacea, which require to rise frequently to the surface of the water for the purposes of respiration, have tails lying horizontally with the water, and not perpendicularly in it. This nice proviso in nature is to enable them to rise and sink with greater facility. They have only to strike their flat tails against the waters in the depth of ocean, and straightway they are sent many fathoms upwards; a contrary caudal action will send them down into the deeps again. If the whale were not provided with the flat or horizontal tail, it would die of suffocation, as it would then be unable to lift into vital air his huge carcase from the dark unfathomed caves, in which he cannot long rest for want of ventilation. The dorsal, pectoral, and ventral fins of a salmon are the agents by which they rise and sink in the water. By the agency in great part of the caudal fin or tail they are enabled to propel themselves in any horizontal direction."

A salmon cannot spring far out of the water, unless it be deep; but I do not think it need be very deep. In making its spring, it first sinks rapidly by an upward action of the fins, and then suddenly reversing their action and finding a *point d'appui* in the volume of water under it,

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and bringing the saltant powers of its muscles into requisition, it bounds beyond the waters' surface in an obliquely vertical direction, a distance double that of 6ft. if it is necessary that it should do so. I have seen a grilse, and not a very large one, jump upwards and forwards somewhat obliquely the length—I and another calculated—of my fishing rod, that is 17ft. Mr. Young and other observant authorities told me, that before a portion of the mass of rock which, in the course of the large Shin waterfall was blasted, its first ledge was 16ft. from the surface of the water when the river was at its average height. Salmon could spring into the water on this ledge at a bound, and then, stemming the arch-formed cataract, they would ascend to the upper pools." The veracity of Mr. Fitzgibbon is unimpeachable, and I am persuaded that his experience is not exceptional. The idea that the fish took its tail in its mouth may have arisen from the bow-like position it assumes in falling again. This position, it must be borne in mind, is, however, natural. When a youth jumps from a height his legs, if bent completely under him at the moment of his leaving the point from which he springs, invariably straighten ere he reaches the ground by their own weight, or rather by the attraction of gravitation. Thus is it with the salmon, only in that case the head and tail are drawn water-wards first. Dr. Fleming has said in his evidence before a Committee of the House of Commons that he had seen a salmon spring over a fall of 30ft. *Credat*, &c. Bye the way, Ansonius has prettily described the springing of a salmon:

> Nor will I pass the glittering salmon by,
> With crimson flesh within of sparkling dye.
> A hidden impulse first disturbs the stream
> That silent flows; the upward darts the gleam
> At middle water; and the bounding fish
> Strikes with his quivering tail in earnest wish
> To dart aloft.

Certain it is, that some prodigious leaps are from time to time made, and in many cases the fish meet their deaths in their endeavours. This is so at the Falls of Kilmorack on the Bauly in Inverness-shire, where the peasantry are in the habit of laying branches of trees to intercept the fish as they fall from the unavailing spring. According to Harting, in his work "The Sea and its Living Wonders," the same practice obtains at the cataract of the Liffey in Ireland. Mr. Mudie in the "British Naturalist" mentions in this connection a curious incident which the Frasers of Lovat used to astonish their guests with, viz., the voluntary cooking of a salmon. A kettle of boiling water was placed at the side of the fall selected close to the water, and the company waited till a salmon fell into the cauldron and was thus boiled in their presence. The affair seems possible, but hardly probable. I, for one, should not like to wait for my dinner till such a thing occurred. Mr.

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Pennell, not to be behind in curious tales, also tells the following: "Two young ladies residing in the neighbourhood of Thornhill, were recently walking by the bank of the river Nith, when they saw a large salmon almost stranded in a shallow creek; they walked into the water and succeeded in driving the fish up a sort of *cul de sac*, from which there was no escape, and were stooping to secure it, when it sprang completely over their heads, and falling on dry land was captured and carried home in triumph." For this story Mr. Pennell vouches, he having had it direct from the two principal performers.

In order to facilitate the upward migration of these fish, it is satisfactory to know that salmon ladders are being and have been erected on a great many hitherto almost impassable streams, and thanks to this step many of such rivers are now in a fair way of becoming very productive of this splendid fish.

Having reached suitable spots in the higher parts of the river the female commences to make her nest. In this operation she is assisted by a male fish. The character of the site of operations is usually gravelly, and the more disintegrated it is the better. The neighbourhood of the spot is usually also occupied by several other pairs of fish, and it is common to observe salmon trout and the youthful male parrs present at the time the adult fish are about to transact their domestic business. I was at a loss for a long time to understand what purpose was served by these intrusive and pugnacious little fish, but their constant and close attendance at last led me to believe that they afforded protection to Mrs. Salmo Salar whilst her lord and master was engaged in driving off importunate rivals. The parrs also possess the power of impregnating the ova, and constantly exercise it. It may be mentioned that the female parrs can lay no eggs. It seems absolutely necessary that she should descend to the sea before her maternity is possible.

The terrific combats which constantly take place between the male fish and other males equally amorous often assume a serious character for the devoted spouse. It not unfrequently happens that, so prolonged has been the strife and so sanguinary the result, that his strength only enables him to fecundate the ova and he then expires. During these fierce onslaughts the female calmly but vigorously goes on with the maternal business she is upon, and seemingly it matters little to her which of her knights is triumphant, an instinct appearing to inform her that in no case will her labour be in vain, for either an adult male or a parr will perform the essential impregnation for a surety. *Apropos* of this subject, I have recently come across an excellent account of a salmon fight, which I extract from the "Zoologist" of the year 1847, page 1650, and, as it so graphically describes what I have often witnessed, I repro-

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duce it for my readers' delectation:—"While several cuttermen were on their rounds the other day and patrolling along the Findhorn between Glenferness and Dulcie Bridge, they observed an unusual commotion amongst the spawning beds of the ford. On approaching the spot they perceived two large male salmon engaged in mortal combat for a female. Never did chivalric knights do battle for the hand of lady fair more fiercely than those burly lords of the flood. The tranquil bosom of the stream was lashed into foam by the struggle of these finny antagonists, the object of the fray in the meantime silently beating about, spectatress of the fight. From the appearance of the stream — dyed with blood and gradually assuming its former smooth surface—it was evident the contest was over. One of the salmon at last floundered on the surface dead, and the victor, it may be conjectured, exhaustively bore off the prize. The men who had the curiosity to watch the fight as a proof of their story, conveyed the dead salmon to the nearest dwelling house, that of Mr. Geo. Mackintosh, March Styrpe, near the entrance of the secluded valley called the Sheens. The victorious salmon had torn off the flesh, or rather fish, along the back, from head to tail to the very bone."

The weapons in use are the teeth and a cartilaginous but very hard bone or excrescence, which develops on the point of the lower jaw. In striking its opponent it usually darts fiercely forward in a direct line, and does not I think turn on its side purposely, although the concussion often obliges it so to do. The teeth are used to tear as a bulldog would. Sometimes in old salmon the jaws, from the growth of the excrescence above mentioned, do not close sufficiently to allow of food being readily retained, and the "old soldier," as he is colloquially termed, like an old eagle, dies of starvation and general *malaise*.

But to return to the female fish. In making her bed she exercises a peculiar movement. The powerful tail propels her closed muzzle into the gravel, deeply or otherwise according to its state of disintegration or pebbly character, and she moves the loosened stones slightly aside by a quick turn on to her side. This gives a glancing appearance, which is a beautiful sight. The friction does not seem to injure her head to any great degree, it appearing to be lubricated copiously with the ordinary mucous or slime, the secretion of which at this time is greatly increased.

According to the size of the fish the operation goes on from one to seven days, and as the eggs are usually laid in batches at small intervals, it is obvious that the attentions of the male are frequently required. A slight mucous matter envelopes the eggs at the moment of spawning, and is supposed to give some little attachment to the egg. Whether this be really so or not I am unable to say. In the trout ova there is no stickiness apparent, however, and I am disposed to think that the specific

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gravity of the ova alone keeps them in their place till the spermatozoa of the milt impregnates them. The male, in order to effect this, ascends to a point a little above where the deposited eggs lie—the distance is determined by the rapidity of the stream—and gently sheds the milt so that it mingles with the water and falls upon the ova. He is supposed to possess two spines in the ventral fins, by which he steadies himself in the operation. This being concluded, the impregnated ova are lightly covered up, and remain from eighty to 140 days—unless eaten by old unfecund fish—before the embryo breaks the horny covering.

Before passing away from this interesting branch of the subject I may, perhaps, be allowed to jot down a few odds and ends in connection with the ovum *per se*. First, as to the size. The size of the eggs of an adult salmon are usually about that of a medium-sized pea, but I notice that it varies slightly with the size of the fish. The colour is a beautiful opaline pink, but the depth of this also varies with the *habitat* of the fish. The ova of a Severn salmon, for example, is of an exceedingly rich deep colour, whilst that of a Wye grilse is much paler. The colouring matter distinctly tints water in which they may be placed and stirred. When the egg is exuded a tiny valve which closes from within is open. The spermatozoa of the male remains remarkably active until it enters its microscopical seed into the valve, which thereafter immediately closes, and the egg becomes impervious to moisture until its vitality, from some inherent or untoward cause, declines, when the valve again opens, and water being absorbed, the ovum turns to a creamy white. The skin of the healthy ovum is very tough until the latter days of impregnation, when it, like a fowl's egg, seems to become more porous, and at least is capable of being broken by the struggle of the confined embryo. As a proof of the strength of the egg, I may mention that a weight of 6lb. did not burst, nor *kill*, a salmon egg on which I experimented, for it was afterwards hatched, and the alevin lived for four weeks, only to fall a victim to our voracious little friend the freshwater shrimp.

The changes undergone by the egg towards vivification are very gradual and interesting, and would well repay the time spent in microscopically watching them. These are precisely similar in the case of trout, reference to which is made in the chapter referring to them. At last the incarcerated alevin becomes strong enough, and with one or two terrible convulsions breaks through the restraint of his prison house, and, as if delighted with the unrestrained freedom of a new existence, mounts to the surface of the water, or strives to do so with a straggling wobbling motion, and, having spent his superfluous force in this, falls prone and exhausted to the bottom, where, behind a tiny stone or some other convenient hiding place, it buries its head out of the light, as yet

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too strong for the unrelaxing pupil of its lustrous eye. At this stage of its existence it is an especially toothsome morsel for the larvæ of various insects, as well as crayfish and the *pulex gammari*. The alevin eats nothing until the umbilical sac is absorbed, when it sets to and revenges itself on its former enemies to an earnest tune.

I now take up another phase of the existence of *Salmo salar*, viz., its parrhood. The young salmon, after it has found its appetite as indicated above, becomes remarkably voracious, and if he be artificially fed, is in great danger of dying from gluttony. I have known little gourmands of scarcely an inch and a half long eat the tiny blood worm—or rather gorge it—until the worms have ruptured the cæcum of the fish and so killed it. This may sound comical, and so it is, but not for the fish. In the natural state the food consists of all the microscopic crustacea and tiny annelids abounding in rivers, and on it, if no enemy assail, they will rapidly gain size. In confinement fish roe, liver grated, chopped worms, and even biscuit are given, I think in many cases improperly, and to the generation of disease. I have ever been an advocate of natural food, with which any microscopist can supply his fish at the time when they chiefly require it, viz., just after arriving at the dignity of parrhood. The parr is always marked with spots down the lateral line, and is mottled on the back somewhat like a trout, but with the "finger marks" well developed, until it assumes the smolt or sea dress, when it becomes silvery like its progenitors.

Before passing on in the history of the fish, I would, for the benefit of those who care to pursue artificial fish culture, either as a recreation or for profit, give a few remarks on the management of the young fish, from the time of hatching to the time for their turning in to do for themselves. First of all a copious supply of oxygenated water is necessary as a primal condition, and next cleanliness, and finally moderate feeding. It is highly necessary that the oxygenated water be not too saturated with air, or a curious and disastrous exigency will ensue. I well remember having enormous trouble with a lot of young fish because of the excess of air in the water supplied them. It was in this wise. The ordinary supply in my tank being thought inadequate, I had a pipe put on in communication with a large cistern of filtered Thames water used for drinking purposes. The force with which the water rushed from its outlet into my tank amongst the young fish impregnated it with additional air, and in a few hours I was alarmed by the ludicrous sight of about 3,000 young fish floating alive, and belly upwards, on the surface. Their bellies presented the appearance of bladders, and they were evidently helplessly suffering with flatulence to a most alarming degree. Cut off the cause and the effect will cease is an old respectable proverb, and this I did, and

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succeeded in saving four-fifths of them. The swellings gradually grew less, and those whose stomachs had not burst recovered their usual manners, customs, and appearance in a few days. This is so novel an experience that I have had no hesitancy in here recording it.

In reference to cleanliness, it is useful to know that it is almost placed beyond doubt that the gill fever is the result of minute organic matter of a more or less acrid nature getting entangled in the branchiæ of the young salmon. So far as I know there is no cure except that used in the former case; a fresh sod or turf will often do away with or prevent this destructive fungus.

The parr having lived some three or four years laying the foundation of a sturdy after growth, it proceeds to put on the smolt dress, and as the spent adult fish slowly drop downwards, it also passes on to the estuaries and thence out to sea. It is said that when ready for the trip the smolts assemble in sculles or shoals and proceed in family groups at the rate of about two miles an hour. They are excessively cautious when they arrive at an obstacle, and a waterfall to be traversed is a source of contemplation for a shoal of smolts which sometimes engages their attention for many hours. Mr. Pennell thus quotes an eye-witness of their caution:—"They no sooner came within the influence of any rapid current than they in an instant turned their heads up the stream, and would again and again permit themselves to be carried to the very brink, and as often retreat upwards, till at length one or two, bolder than the rest, permitted themselves to be taken over, when the entire flock one by one disappeared, and then, so soon as they again had reached comparatively still water, they turned their heads towards the sea and resumed their journey." After reaching the estuaries they do not at once plunge into the salt water, but accustom themselves gradually by remaining in the brackish water till the necessary alterations of constitution and habits are effected.

Now what constitutes the food of the smolt after its arrival in the salt water is a matter rather for conjecture than actual determination here. That "potent grave and reverend" doctors have disagreed is certain, and I certainly do not feel competent to decide the moot points involved. Professor Quekett, in 1860, stated it as his opinion that salmon search deep water for the ova of the sea urchin. Professor Huxley, on the other hand, believed that its food consists of entomostraceous crustacea, found frequently on the surface of deep water in semi-solid masses. Dr. Knox thought that the ova of various kinds of echinodermata (star fish, sea urchins, encrustes, &c.,) and some crustacea (crab and lobster family) form its food. Faber, in his "Natural History of the Fish of Ireland," says the salmon feeds on "small fishes and marine

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animals." Dr. Fleming mentions the sand eel, as does also Sir J. Richardson, and Sir W. Jardine confirms this. A Mr. A. Morrison says that within flood mark he has taken several good sized herrings from their stomachs. A writer in No. 87 "Once a Week" also says, "My friend Mr. Walter Campbell informed me, that he once had a wonderful haul of salmon at Islay in an estuary of the sea. He landed 716 and many of them escaped. As the net approached the shore, he saw the fish discharging the contents of their stomachs, which consisted of *small eels*." Now here we have diversity of opinion, which, taking into consideration the probable accuracy of observation in those who utter them, is at least remarkable. For the convenience of the reader I give a table of these opinions that he may see at a glance the state of the subject at the time I write.

FOOD OF SALMON IN THE SEA.

Professsor Quekett	Ova of sea urchin.
Professor Huxley	Entomostraceous crustacea.
Dr. Knox	Ova of echinodermata and some crustacea.
Mr. Faber	Small fishes and marine animals.
Dr. Fleming, Sir J. Richardson and Sir W. Jardine	Sand eels.
Mr A. Morrison	Herrings.
Mr. W. Campbell	Small eels.

With such a variety of food, no wonder the smolt gets fat.

The most curious circumstance, however, in reference to the food of salmon is the fact that whenever they are caught the stomach only seems to contain a sort of thick mucus. Clearly the fish do feed—or are disposed to feed—in rivers, or anglers would not be able to take them. An explanation has been given, of a somewhat unlikely character, to the effect that immediately *Salmo salar* finds himself hooked he ejects all his stomach may contain; but this idea has, as far as I know, never been corroborated except by the writer in "Once a Week," quoted above. Certain in any case it is that very little is ever found in a hooked salmon's stomach; and if they really disgorge—which, from analogy with other fish, I am disposed to consider nearly impossible—it could not have escaped observation. The most probable hypothesis I know of is one broached in, I think, the "Field" some years ago, that the gastric juice of the salmon was of instantaneous action, or nearly so, and that consequently its food was almost at once dissolved.

I before alluded to the return of salmon to their native streams ordered by what seems to be an unfailing instinct of selection. Before going away from the subject of salmon in the sea it may interest my readers if I reproduce a valuable piece of evidence of the intelligence of returning salmon in this direction. It is told in Fitzgibbon's (Ephemera) "The Book of the Salmon" as follows: "Loch Shin, a piece of water

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about twenty miles by fourteen, in the heart of Sutherlandshire mountains, is the immediate feeder of the river Shin, noted for the abundance of its salmon. The loch itself has four feeders, middling sized rivers—namely, the Tirry, the Fiag, Garvie, and Curry, in which, previously to the year 1836, not a salmon was ever seen, though many were in the habit of entering the loch or lake. In the year mentioned, at the request of the Duke of Sutherland and Mr. Lock, M.P. (since deceased), salmon were caught in the river Shin shortly before the spawning season and conveyed to the four rivers above-named, amongst which they were distributed in due proportion. Mr. Andrew Young, the Duke's salmon factor and our best natural historian of salmon, was the managing director on the occasion. In the winter season all the fish spawned each in the river into which it was put. Now mark one of the consequences. Salmon at present, and ever since, come regularly to spawn in all these heretofore salmonless rivers, traversing the lake, &c., to do so. Nay, more, the fish hatched in the Tirry, at least those that survive long enough to return to the Tirry, and the fry of the other three rivers, return from the sea to them, each grilse or salmon entering never failingly the actual stream that gave it birth. What wonderful and unerring instinct! One would think they would remain in the river Shin and spawn where their first ancestors had spawned—but no. They leave their own natal shallows, pass down the lake, through the river Shin, along the Kyle of Sutherland to the sea, and there, having become adolescent in three months or so, they retrace their route, and, after necessary rests on their long voyage, revisit for the first time, but not for the last if they survive, the scenes of their birth and infancy."

Having thus given an extract of great interest as bearing upon the upward journey of salmon, I conveniently turn to another branch of the subject which requires a few remarks from me—I mean the downward course of kelts, or fish which have spawned. From the description of the spawning process, as might be inferred, the great energy of the salmon and its splendid condition both disappear with the culminating effort of ova deposition and fecundation. Immediately this is performed the parent fishes drop back exhausted and emaciated to a degree to such quiet nooks as may present themselves. Some of the grilse manage to reach the entrances before the older fish, but, in the majority of cases, the exhaustion is too entire to allow of their reaching the sea before the winter months. In a large number of instances they are passing down during the spring months, and are a great nuisance frequently to the angler, who, after perhaps fighting what he has hoped to be a well grown grilse or salmon for an hour, eventually lands a wretched lanky foul-looking kelt, with a jaw like a ram's horn, and scarred like a worn-out

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mariner, as he is. There are various local names for these fish. The females are termed "baggits" and the males "kippers." They are utterly unfit for food, and should, under no circumstances, be retained. It is usual to find a white parasitic worm (*Lernea salmonis*, of Linnæus), infesting the gills, and the general appearance of this wretched being is pitiable. Fortunately it is illegal to gaff these fish, so that now a greater proportion than hitherto reach the sea, and are often in time to commence re-ascension with an added weight of from 7lb. to 10lb. Mr. Cholmondeley Pennell gives a table of kelts which had been taken by anglers on descending, marked with a numbered copper or gutta percha tablet, returned to the water, and re-caught during the autumn months on the Duke of Athol's estate on re-ascension. It shows so conclusively the wonderful rapidity of growth and recuperation the *Salmo salar* undergoes in salt water, and the desirability of carefully enforcing the law as to the return of kelts to the water that I may be forgiven for reproducing it.

Caught as Kelts or Spawned Fish returning to the Sea.			Retaken Ascending River as Clean Fish.		
	1859.	Weight.		1859.	Weight.
No. 21.	Feb. 14	10lb.	No. 21.	Aug. 18	17lb.
No. 76.	Mch. 2	11½lb.	No. 76.	„ 18	17lb.
No. 95.	„ 29	12½lb.	No. 95.¶	„ 12	19lb.

Thus it will be observed that in a few months from 6lb. to 7lb. each had been put on, which is, roughly speaking, at the rate of about a pound per month. Before going from this head it may be noted that kelts may occasionally improve in the rivers sufficiently to deceive the tyro, but in every case a comparison between a "clean run" fish and the "spent" fish will not fail to show the difference. The head of the latter is always disproportionate, and there is a general lankiness not observable in the former. Whilst upon the weight of salmon I may here quote Mr. Archibald Young, Inspector of Scotch Salmon Fisheries. He says, "as a rule the largest fish are found in the largest rivers, though very heavy fish are got in comparatively small rivers, as in the North Esk, near Montrose, the Roy, a tributary of the Spean, and the Stinchar in Ayrshire. Mr. Yarrell mentions one of 83lb. as having come into possession of Mr. Groves, of Bond-street, and the following is a catalogue of those in Mr. Buckland's museum:

	Weight. lb.	Length. ft. in.		Weight. lb.	Length. ft. in.
One Tay	70	4 3	Tay	51	4 3
Two Rhine	69	4 8	Wye	50	4 2
Shannon	54	— —	Shannon	46	4 3
Tay (Kinfauns)	53	4 0	Wye	44½	3 10½
Rhine	15½	4 3	Tay (Kinfauns)	42	3 8

"Probably the largest salmon ever caught by the rod was taken by a

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predecessor of the present Earl of Home in the Tweed, its weight being 69½lb."

In concluding the above general remarks on the natural history of the fish and its migratory habits in particular, I cannot forbear to quote the epitome Mr. Pennell gives of the *proved* facts anent the fish, which, although written some fourteen years ago, are yet of their full value, and have never, so far as I know, been upset. The following is his admirably compressed synopsis:

"1. Salmon and grilse invariably spawn in fresh water, if possible, both the eggs and the young fry whilst in the parr state being destroyed by contact with salt water.

"2. The eggs are usually deposited on gravelly shallows, where they hatch in from 80 to 140 days, according to the temperature of the water. Eggs remaining unhatched beyond the latter period will seldom hatch at all, possibly from having been destroyed by the low temperature.

[I cannot quite agree with Mr. Pennell in reference to the latter suggestion. Cold is not likely to destroy eggs, as the transportation of ova to New Zealand in ice has shown. The more probable reason is that the ova never were fecundated.]

"3. The eggs deposited by the female will not hatch under any circumstances unless vivified after exclusion by the milt of the male, and—at least up to the period of migration—there is no difference whatever in fry bred between salmon only, between grilse only, between salmon and grilse, between salmon and parr, or between grilse and parr.

"Note.—The female parr cannot spawn, but the male parr possesses and constantly exercises the power of vivifying salmon and grilse eggs.

"4. The fry remain one, two, and in some cases three years in the rivers as parr before going down to the sea, about half taking their departure at one year, nearly all the others at two years, and the remainder, which are exceptional, at three years old.

"5. All young salmon fry are marked with blueish bars on their sides until shortly before their migration, up to which period they are parrs. They then invariably assume a more or less complete coating of silvery scales and become smolts—the bars or parr marks, however, being still clearly discernible on rubbing off the new scales.

"6. The young of all the species here included in the genus *salmo* have at some period of their existence these blueish bars, and, consequently, such marks are not by themselves proofs that fry bearing them are the young of the true salmon.

"7. Unless the young fish put on their smolt dress in May or early in June, and thereupon go down to the sea, they remain as parrs another

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year, and without smolt scales they will not migrate, and cannot exist in salt water.

"8. The length of the parr at six weeks old is about 1½in. or 2in., and the weight of the smolt before reaching the tidal wave from 1oz. to 2oz.

"9. In at least many cases smolts thus migrating to the sea in May and June return as grilse sometimes within five, generally within ten weeks, the increase in weight during that period varying from 2lb. to 10lb., the average being from 4lb. to 6lb., and these grilse spawn about November or December, go back to the sea, and in many cases re-ascend the rivers the next spring as salmon, with a further increase of from 4lb. to 12lb. Thus a fish hatched in April, 1854, and marked when migrating in May, 1855, was caught as a salmon of 22lb. weight in March, 1856.

"10. It appears certain, however, that smelts do not always return during the same year a grilse, but frequently remain nine or ten months in the sea, returning in the following spring as small-sized salmon.

"Note.—It will thus be seen that the fry of the salmon are called parrs until they put on their migratory dress, when they become smolts, and go down to the salt water; grilse, if they return from the sea during their first year of migration, and at all other periods salmon.

"11. It has been clearly proved that in general salmon and grilse find their way back to spawn to the rivers in which they are bred—sometimes to the identical spots; spawn about November or December, and go down to the sea as 'spent fish' or kelts in February or March, returning in at least many cases during the following four or five months, as clean fish, and with an increase of weight of from 7lb. to 10lb.

"Note.—Shortly before spawning, and whilst returning to the sea as kelts or spent fish, salmon are unfit for food, and their capture is then illegal. 'Foul fish' before spawning are, if males, termed 'red fish,' from the orange-coloured stripes with which their cheeks are marked, and the golden orange tint of their bodies. The females are darker in colour, and are called black fish. After spawning the males are called kippers and the females shedders or baggits."

Before passing from the general subject of this fish's natural history it becomes necessary to make some rather extended remarks on the diseases to which it is liable. I shall not pretend to be exhaustive on this branch of the subject, but rather suggestive, whilst at the same time I desire to impress on my readers the importance of the subject which the recent history of fish diseases seems fully to imply. In an earlier chapter I have given some particulars of piscine diseases which, as the reader will see, are chiefly parasitic. I did not then do more than hint

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at the development one form of epidemic had attained in connection with the salmonidæ generally, and *salmo salar* particularly. I shall here advert to it more comprehensively in view of its recent history.

In the seventeenth report (1877-78) of the Inspectors of Salmon Fisheries, England and Wales, it it stated that : "Early in the month of March of the present year ('78) a most mysterious and fatal disease began to affect the salmon in the river Eden, which, running through Carlisle, pours its waters into the Solway Firth." The first indications of it were communicated by Mr. Pattison, of Carlisle, in a letter, dated 20th March, '78. In it he said that "the disease nearly always shows itself from the tip of the snout back on to the head as far as the eyes, and eats the skin and flesh and frequently destroys one or both eyes ; besides, it affects the fish in various parts of the body, especially in the fins, and immediately around them. The fish while living has quite a piebald appearance, the spots affected are 3in. or 4in. in diameter. Most anglers of the Eden have noticed this season (1877-78) many of the salmon have thrown themselves out in a totally different manner to any that has hitherto been seen ; for instance, a fish will give a plunge on the top of the water, going right across from one side of the river to the other in a series of plunges." The disease also appeared simultaneously in the Nith, the Lune, and the Annan.

Mr. Groom Napier reported that, "having carefully examined it (a piece of salmon's fin infected with fungi) microscopically, I am able to say that it is the *Saprolegnia ferax* ;" and he also stated that he found in the stomach some granules that represent a stage of development of the *saprolegnia*.

The remarks of Professor Stirling, which are reproduced in the report, whilst not referring to the technical natural history of this peculiar and interesting parasite, are nevertheless of considerable importance. He says : "I think I have made out the family the fungus belongs to, and its mode of growth by spores and also vegetatively. I also wish to say that the fungus appears to me to be of a very irritating nature, causing the fish such torture that they destroy themselves in their efforts to get rid of their tormentor. The sores upon the fish are not caused by the fungus, but by the fish themselves, by rubbing the parts of their bodies affected upon stones or rocks, and any projections they find to suit the parts affected. The roots of the fungus are very superficial, not deeper than the mucous and epidermic layers on the smooth and scaleless parts, and in the parts covered with scales penetrating to and spreading laterally along their outer surface. The salmon sent to me were maiden salmon, and in good condition, the pyloric cæca being quite embedded in fat, and the whole viscera healthy, the muscles having the

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usual quantity of oil found in a so-called seasonable salmon. Neither of the fish had ever spawned, the ovaries being in a semi-embryonic condition, and weighing only 7dr. in each, the oviducts also being in the thread form, never having been fully developed, as in the fish that have spawned, and from the quantity of fat on the gut and pyloric appendages, I consider they had been only a short time in the river. I may also mention that all the fish, both trout and salmon, had tapeworms of large size, 2yds. in length, and 3-16th of an inch in breadth. One salmon had from 60yds. to 80yds. of these worms in the pyloric portion of the gut. I have preserved the young *in situ*. . . . From the effect upon my hands in the course of manipulation and working with the affected carcases, I have reason to think that the plant is a very pungent, if not poisonous, one."

I may here mention that four painted casts of the stages of this disease may be seen at the Museum of Fish Culture, South Kensington.

According to Mr. W. J. Smith, who published some excellent drawings, and a good description of its various changes and developments in the *Gardeners' Chronicle* for 4th May, 1878, it afflicts not only salmon and trout, but eels, lampreys, flounders, minnows, &c. I have identified it myself on carp and eels, and I am strongly persuaded that the "gill fever" of young fish is due to a growth of the same family.

The question which naturally arises is, "What is the cause?" This has been variously answered; but as yet no definite conclusion has been arrived at. It has been suggested that sewage, guano, the want of freshets when the fish are on their way to the sea, overcrowding, factory refuse, mine water, &c., are each and all responsible for the effects described.

Professor Stirling observes: "I am quite unable to say what the cause of the fungus may be, but as I found foreign matter of various kinds entangled in the mycelium of the fungi, I have pretty good grounds for thinking it may have arisen from pollution. The foreign matter found in the mycelium or fronds of the plant were torulæ, or yeast fungus, triple phosphates, fecula, human hair, and hairs of cat and mouse, also dismids and diatoms, shreds of dyed wool and cotton, with other fragments of matter unknown to me."

I have repeatedly noticed that the presence of fungi on other fish is invariably coeval with these larval cestodes. In order to give some idea of the tremendous decimation of these noble fish during the season of 1877-8, I may mention that, according to the official report, as many as 1451 fish (all salmonidæ), were buried from the river Eden between 1st March to 20th May, 1878.

The kelt is almost invariably infested with a white worm and a

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species of the lamprey, or stone-sucker, which is occasionally found attached, having bored a hole through the skin. The liver of the fish also occasionally is found to contain numbers of fluke-like worms, of a very interesting nature.

The importance of the salmon as a food and sporting fish cannot be over-estimated, and the prominent legislation for the salmon interest has resulted in a vast increase in production during the last decade or two.

Artificial breeding has also effected great alterations. This is especially apparent on the Tay, for example, which has increased in rental value from a little over £9000 in 1855 to nearly £23,000.

From this it would certainly appear conclusive that artificial breeding is an unqualified success if properly and scientifically pursued; but it is more than doubtful whether "artificial breeding can ever compete at all with the natural process; that is to say, the opening up of fresh spawning grounds and allowing the fish to have their own way."

Artificial breeding should, however, be encouraged as a supplementary art likely to secondarily advance fisheries and instruct men more thoroughly in the natural history of fishes.

That curious question, the earliness or lateness of salmon seasons and rivers, has been productive of much discussion. It is a well-known fact that whilst some rivers are very late, others not far removed are proportionately early, and the anomaly seems not easy of solution. There also obtains an idea that an early river might be made a late river by a judicious introduction of late river fish or ova, and *vice versâ*. To my mind the temperature of the water alone causes the earliness or lateness of a salmon river.

It has been said that rivers with a lake at the head are invariably early. This, however, will not stand, for nearly all the rivers on the western shores of Ross-shire, Inverness-shire, and Argyllshire are headed by or traverse a lake, and it is a certainty that they are nearly all late. However properly this, therefore, may apply in a few cases, it is clear that as a theory, professing to account for the phenomenon referred to, it is of no use.

I approach the subject of salmon fishing with considerable trepidation. When my eye travels over the pages of "Bibliotheca Piscatoria," and beholds the array of authorities on the subject, whose writings are for the most part the records of an experience extending perhaps over a generation, or even more, I am conscious of my own unworthiness to do justice to so great a theme. Yet will I not despair. My observation of the habits of fishes and my long experience of coarse fish and all other members of the *salmonidæ*, together with a studious course of salmon

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angling, must be a sufficient justification. True, I am not a "senior angler," as the critics so punningly and coincidently termed Mr. Pennell —though, by the by, that gentleman is not so very "senior." However, I know what I am talking about, and, me seems, that is all that the readers of "The Practical Fisherman" ought to require.

So much for self, on which subject, as Lord Byron has remarked in one of his letters, "All men are fluent, and none agreeable." Now for the salmon. What says the earliest writer on fishing for this truly noble fish? Hear good Dame Julyana Berners: "For by cause that the samon is the most stately fyssh that ony man maye angle to in fresshe water. Therefore I propose to begyn at hym. The samon is a gentyll fysshe, but he is comberous for to take. For comynly he is but in depe places in grete ryvers. And for the more parte he holdyth the myddys of it, that a man maye not come at hym. And he is in season from Marche on to Myghelmas. In whych season ye shall angle to him with theyse baytes, whan ye maye gete theym. Fyrste, wyth a redde worme in the begynnynge and endynge of the season, and also wyth a lob that bredeth in a dunghyll. And specyally wyth a soverayn bayte that fedeth on a water docke. And he bythith not at the grounde but at ye floate. Also ye maye take hym, but it is seldom seen with a dubbe at such time as whan he lepyth in lyke orme and mannere as ye doo take a troughe or a gryalynge. And thyse baytes ben well provyd baytes for the samon."

This is all Dame Julyana has to say, and, quaint as it is, it nevertheless is in the main evidently the outcome of experience. Barker, in his "Barker's Delight," says but little more even in 1655. This is his poetical version of the chapter he gives on *Salmo salar*:

> Close to the bottom, in the midst of the water,
> I fished for a salmon, and there I caught her.
> My plummet twelve inches, from the large hook
> Two lob-worms hanged equal, which she never forsook,
> Nor yet the great hook with the six-winged fye,
> And she makes at a gudgeon most furiously.
> My strong line was just twenty-six yards long;
> I gave him a time, though I found him strong.
> I rould up my tackle to guide him to shore;
> The landing hook helped much, the cookery more.

Remarkably unmelodious doggerel is this, but it is a curiosity in its way, for it cannot be said to be anything but a close paraphrase of the following. Certainly, here is an example of prose and "worse":

"The angler that goeth to catch him with a line and hook must angle as nigh the water as he can with one of these baits. He must take two lob-worms baited as handsomely as he can, that the fine ends may hang most of a length, and so angle as nigh the bottom as he can, feeling your plummet run on the ground some twelve inches from the hook; if you angle for him with a flie (which he will rise at like a trout), the flie

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must be made of a large hook, which hook must carry six wings, or foure at least; there is judgmente in making these flyes." This is all Barker says, and quite enough too. I simply quote these two monologues that the reader may contrast the state of knowledge then with what follows.

It has been said, and said wisely, that at the moment of the salmon taking the bait the actual culmination of all the difficulties of salmon angling ensues. The necessity of keeping one's vibrating nerves under control is the supremest of tasks when this moment arrives, and the result is ever one of two—either the fish is not hooked, or he is. If the former, there is a partial remedy in allowing the bait to remain perhaps some five seconds near the spot, when the fish may turn and take it; if the latter, the unalloyed pleasure of playing and ultimately conquering presents itself.

Before going into the widely extended subject of how these alternatives are realised, I will jot down one or two "notes" as to the proper method of striking a salmon. First, what say *the* tribunes of the angling world? Mr. Pennell observes that the "art is to resist for a moment the inclination to strike, only for one moment, but long enough to allow the fish to take and turn down again with the fly, and then strike, if you will, not a slight, hesitating blow, like the tap of a lady's fan—for there is often a long line and a heavy strain on it between the salmon and his would-be captor—but a strong, steady, determined stroke, bringing the line up as flat as a knife and driving the tapering hook point well in to the barb." This method of striking of course arouses all the pugnaciousness—not fear—of the gallant fish, and then comes the brief contest, in which all the pleasures and doubts of hours and days seem compressed.

Now, what says Mr. Francis Francis? "Ten times more fish are lost from striking too quickly than from striking too slowly . . . If you strike and pull the fly away from him he goes down, disgusted with the rudeness of the gentleman who asked him to dinner and then snatched his dinner out of his mouth; you might almost as well have assaulted him with a fork, or, in other words, pricked him . . . Then some salmon fishers say you should not strike. Yes, I know that; but what they mean by striking is, you should not hit a salmon as if the roof of his mouth were a paving stone, or you were punching a whole flight of spinning tackle into a bony old pike, with a mouth like a quartz crushing machine. . . . To hit a salmon violently, as you would a pike, is in some respects certainly not advisable, as you may force him into his most violent and dangerous action when he is best prepared for it, and when, possibly, the guard is not the most suitable; whereas, by a gentler

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mode, not calculated to alarm quite so forcibly, the sharp edge of the steel may often be taken out of him, and you may negotiate your exchanges upon terms of more equality, in case the hooking place is broken water dangerous with sunken rocks or other obstructions, as it sometimes is."

Thus Mr. Francis, than whom there is no more practical angler living. Yet notice the divergence of opinion between these two masters of the gentle craft. One recommends "a strong determined stroke, bringing the line up as flat as a knife"—whatever that may mean—"and driving the tapering point well in to the barb." These are Mr. Pennell's words. Mr. Francis, on the other hand, speaks with considerable uncertainty. "Ephemera," perhaps the finest salmon fisher that ever put pen to paper, says, however, "nothing more than a gentle stroke or short, sharpish pull, is necessary to insert in some part of the fish's mouth some part of the barb," and with him I agree, and these are my reasons: The salmon takes a bait in a widely different style to a trout. This impetuous fish literally jumps, darts, flies at the bait, and it is either into the mouth and himself turned, or it forced away again by a volume of water, instantly. In such case an almost instant strike is necessary. The case is, however, different with salmon. Its great bulk renders its movements, notwithstanding its gigantic strength, of a slower nature, and its run at the fly is in this particular vastly different to that of a trout. Moreover, it rises up under the fly and takes it, causing a break in the water, which is instantly immensely increased by the downward plunge, which raises the water, and causes it to assume a sort of swirling convexity. At this instant the stroke should be made, and made swiftly, but not with continued and even vigour. The strong determined muscularity of Mr. Pennell's stroke rouses the fiercest instincts of the fish if it hooks him, and often gives rise to a lot of unnecessary risk. Besides if, as is some times the case, the hold of the hook promises to be light and fragile, such violence will infallibly tear it out, and thus disturb the temper of a fish whose voracity might, in all probability, otherwise have suggested his trying again to secure the bait. A side strike is often advisable, but this depends upon the circumstances under which the fly was taken.

I will now briefly treat on the selection of tackle and the methods of playing the fish when fly fishing is the style resorted to.

First, as to the rod. Opinions as to this indispensable part of the salmon fisher's outfit are as divided as those concerning the "strike." "Ephemera" says no rod should be longer than 17½ft., and never less than 16ft. Pennell gives the measurements of his rod, which was 18ft. 6in., and he says that "very broad waters sometimes demand a longer

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weapon." Francis puts it at from 16½ft. to 21ft. The Master of Lovat, he says, uses one 24ft. long. For all ordinary usage, however, from 16½ft. to 18½ft. is ample length, and even a tall man need not necessarily use a 20ft. rod because he is tall. Neither is it absolutely indispensable that a strong man use a long rod because he is strong. Yet some seem to go on this plan in selecting their salmon "pole." I am of opinion that a 16ft. 6in. rod is sufficient for any river, and as I am of about the average height (5ft. 8in.) of Englishmen and average strength, some criterion of the length suitable to himself by the tyro may be arrived at. The rings should be stiff and solid, like those shown in the tackle-making section.

As to the material of which the rod should be made, opinions, of course, differ again, but it seems that hickory and ash are put out of court by greenheart, which is at once a solid and elastic wood, reducible to the most whip-like proportions, and at the same time retaining all its toughness. The total weight of a greenheart 19ft. rod should not be more than 3lb., or an 18ft. more than 2lb. 10oz., and, even as some horsemen are said to ride several pounds lighter than their actual weight, *i.e.*, they seem so to the horse, so also a well-balanced rod, when taken in the hand, should not nearly appear its dead weight. The London makers manufacture some exceedingly neat and well-finished salmon rods now, although in years agone a Castle Connell or Scotch rod was ever preferred. I most distinctly pronounce for a ferruled rod in preference to a spliced one. Every rod should have a few spare tops, in case of breakage.

Of the reel I have little to say. It should be a click or check, one made of brass, and bronzed. Its capacity ought to be equal to about 120 yards of line. The handle should be cone shaped, and accurately fitted at its base to the winch plate, so that no line can possibly get round it and there remain. Behind the winch, nearest the butt, it is a good plan to fix a spring so that any line that by chance becomes loose and otherwise would wind round the winch may be thrown forwards and off, on somewhat the same principle as that adopted in the construction of the gates on the barge-paths of the Thames, by which the barge lines are thrown off without let or hindrance. I am an advocate for placing the winch near the end of the butt, both on account of its weight tending by leverage to balance and so decrease the aggregate weight of the rod, and because it is handier when a fish is hooked.

The line should be of silk, and contain from eight to fourteen strands, plaited. I have one by me now which contains twenty-seven, but such a number is too great, for the reason that the friction in running through the rings soon cuts some of the strands, because of their fineness, and a frayed and disagreeable appearance is soon given to the line, besides the

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inconvenience of the additional weight caused by the increased amount of water it carries up with it. An eight strand, plain, whole-laid silk line—I say this because some cheap lines are hollow—well dressed, runs beautifully through the rings, and lasts, if properly treated, for at least three, and often more, hard seasons. A tapered line is exceedingly pleasant, and undeniably an advantage, but its cost is such as to render it somewhat too expensive a luxury to the poor angler. However, I always use one myself, and find its superiority consists in the greater ease with which it can be thrown, and the increased rapidity with which it can be reeled up. Three or four different sized lines should be in stock, to be utilised according to the state of the water and wind. A fine line cannot be got out satisfactorily against a stiff breeze, while a heavy one may; moreover, a fine line cannot be thrown so far as a heavy one, hence the desirability of a selection. I once had a flat salmon line from Norway, which I found to be wonderfully pleasant to use, besides occupying comparatively little room. I wonder where such lines can be got now? I am persuaded that, for fly fishing, they would become very fashionable if carefully made. The casting line should be of gut, good round pliable gut, and consist at its upper part of three strands, loosely twisted, then of two, and finally of a yard length of fine, single, strong, well tested gut. Its length ought to be quite 4yds., and its knots and joins carefully made.

Another implement, which is of some importance, must here be noticed. I refer to the gaff. I confess to not liking the implement. It requires to have a straight sharp point, and a handle of, say 7ft., made solidly but lightly. In using it the hook is cautiously brought in contiguity to the shoulder of the fish, and then a short sharp jerk fixes it in the fish. Many a good salmon is lost because of the repeated drivings, hittings, and plunges made at the fish by the clumsy attendant, and I have often wondered why some other means of securing the fish, of a more precise nature, has not been invented. A landing net made of plaited hard-dressed silk is, in my opinion, superior to the gaff. It must be large, however.

Having, then, described the rod and its attached tackle, the next thing demanding attention is the bait, in this case, a so-called "fly."

The supposition in reference to the salmon fly that it is an imitation of the dragon fly, humming bird, South American butterfly, and what not, is, without question, untenable. The varied and gorgeous fabrications of the salmon fisher are unlike anything in the heavens above, the earth beneath, or the waters under the earth, and differ in their suitableness and killing power almost as much as they do in appearance. In one particular they are all similar; however, they are beautiful pieces of

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colouring, and that is about all that can be said in reference to their natural history.

Why a salmon takes such a meaningless bait I am at a loss to imagine. The fish in his youth is by no means a stupid fish, as I have personally proved; in fact, in my opinion, he is far ahead of the trout in learning such little tricks as can be taught fish in confinement.

It has been said that it looks upon the bait in the same way that a jack does the fly occasionally thrown for his destruction. But this only increases the number of questions to be answered. I am strongly inclined to think that the taking of it is simply the result of curiosity.

That all fish are fond of, or attracted by, bright colours, I have not the slightest doubt. Experiments with an ordinary globe of gold fish will satisfy the reader that this is the case. The vision of a fish is of wide area, its perception is clear and keen, and altogether it may be said to rival the eyesight of the human being. This being the case, why should not colours be pleasurable to the denizens of the water as well as to ourselves? This is a consideration which probably has not occurred to many, but it is worth attention. We are so wrapt up in self that I am convinced our animals receive not one-tenth the observation and sympathy which is necessary for a proper knowledge of them.

Curiously enough, the local flies which take most fish on each of the salmon rivers are, as a rule, of little use on other waters. Of these local flies I am not in a position to treat in a detailed manner, and must refer my readers to Mr. Francis Francis's "A Book on Angling," in which he gives a list which it has been the work of many years to compile. Such flies can always be purchased in the locality, and the dressing of them is in that case always preferable. I give as follows, however, a list of general flies, with Mr. Francis' own directions for tying. I have taken the trouble to tie each one according to his instructions, and I cannot therefore do better than quote them from the excellent manual aforesaid.

The Doctor.—Commence at bend of hook and tie on as a tag three or four turns of fine gold twist. Tail, a single golden pheasant topping, over this, as a butt, a turn of scarlet crewel; body, pale blue floss silk with a hackle a shade or two darker wound on from tail to head (this is varied at times with a blue jay's feather); silver tinsel (in large flies of all kinds the tinsel may be rendered more conspicuous by the addition of some twist wound on beside it); at the shoulder a brown grouse, partridge, or bustard hackle may be wound on—a blue jay is sometimes used over the blue hackle; the wing is a mixed wing, containing fibres of bustard, dark argus pheasant, and claret, blue, and yellow fibres of stained swan feathers, the latter predominating. In smaller flies mallard and pintail are introduced.

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The head is of scarlet crewel. The fly is dressed upon any sized hook, from No. 6 to No. 10, to suit the water.

The Silver Doctor.—Tag, silver tinsel; tail, gold pheasant topping, the turn of red crewel over the stump of it for the butt; body, silver tinsel; hackle, blue as before, with a brown hackle at the shoulder and a small speckled gallina over it; wing chiefly of pintail, with a few red and blue fibres and toppings over it; red crewel head. Size as before.

The Colonel.—There are two ways of dressing this fly. The colour of the one is a bright gold or yellow, and that of the other a red gold or orange. Tag, gold twist, and two turns of bright yellow floss; tail, red and yellow sprigs mixed with gallina, and a topping; no butt; body yellow floss half way up, then orange pig's wool; over this is ribbed, side by side, gold twist and tinsel and black floss—first the twist, then the tinsel, then the black silk; yellow hackle from tail to head, bustard hackle at shoulder; under wing gold pheasant tippet, two feathers rather short; on either side of these strips of bustard and argus pheasant (the dark small speckled feather), fibres of yellow thrown in here and there, and over all a topping, with blue macaw ribs, black head. For the orange variety read orange for yellow. Sizes vary from Nos. 4 to 8.

The Major.—Tag, silver twist and ruby floss; tail, fibres of bustard; hackle, tippet and a topping; body, composite, viz., two turns of medium blue, ditto of dark orange, about four or five of bright scarlet, and two more of blue pig's wool; over this silver and gold twist side by side; a red claret hackle, commencing from the orange wool, the blue wool picked out in longish fibres at the shoulder, over this a bustard hackle, then the wing, and over that a yellow hackle. The wing is composed of white ribbed snipes' feather, with longish tippet on either side, over this bustard and gold pheasant's tail in strips, with red, blue, and greenish yellow fibres; over all a topping; black head.

The Black Ranger.—Tag silver twist and golden floss, tail the bright red breast feather of an Indian crow and a topping; butt, two turns of black ostrich; body, two or three turns of golden floss, ditto of bright fiery red pig's wool, and the remainder of the body black, silver tinsel, and twist; very dark blue hackle, extending from the red mohair, black hackle at shoulder; wing a pair of long jungle cock feathers, a trifle longer than the hook, doubled (that is, a short feather and a long one laid over together, the long one underneath); tippet feathers over them, topping over all; blue macaw ribs, a kingfisher at the cheeks.

The Blue Ranger.—Tag silver twist and gold coloured floss; tail as before, but black ostrich; body, gold coloured floss, and fiery red wool, as before, bright blue pig's wool for the rest of the body; blue hackle, a shade darker from about the middle of the wool of the shoulder; gallina

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hackle over silver tinsel and twist; wing, a pair of tippets, double, single cock over them, topping over all; black head.

The Parson.—There are on the Erne green parsons, blue parsons, and golden parsons, so that the title is rather that of a genera than of any arbitrary arrangement. The following is a description, however, of the best, the golden parson. Tag silver tinsel and mauve floss; tail, two toppings, a few sprigs of tippet, and a kingfisher; body, two turns of golden floss silk, then golden pig's wool, merging into orange; silver twist; golden orange hackle over the wool, red orange hackle over that, and two or three, or more, short toppings, tied in at the breast instead of shoulder hackle; wing, a tippet feather, with a cock of the rock (not a squared feather) on either side, and one above, strips of fantail or woodcock on either side, and five or six toppings; kingfisher's feathers on either cheek, and blue macaw ribs; black head.

The Butcher.—This fly is a general favourite. It will always kill where there are salmon. In the Awe, the Orchy, the Brora, the Nova, the Thurse, the Helmsdale, the Annan, and the Tay and Torridge, and one or two Welsh rivers, it is a prime favourite according to Mr. Francis. Tag gold twist and dark orange floss tail, one topping; butt, black ostrich herl; body, two or three turns of claret, ditto of medium blue, ditto red, and rest of dark blue pig's wool, broad silver tinsel; medium red claret hackle; gallina on shoulder; under wings a tippet and gold pheasant rump feather, over them strips of brown mallard, bustard, peacock wing, wood duck, and blue and yellow swan strips; black head.

The Baker is a standard fly on the Dovey, dressed small. Tag gold twist and lightish blue floss; tail, a topping; but black herl; body three turns of golden coloured floss, dark orange, light blue, and red pig's wool; broad gold tinsel, medium red claret hackle, gallina at shoulder, with light blue over it; under wing two tippet feathers, spray of gold pheasant tail, bustard peacock red, bright green and blue and yellow sprigs of snow all over, blue macaw; black head.

The Candlestick Maker is the invention of Mr. Francis himself. The body for the lower half is black silk, the upper black pig's wool, very bushy towards the shoulder, and picked out at the breast; hackle, golden olive, with claret at the shoulder, tinsel broad silver; tail, scarlet ibis and wood duck; wing, five or six toppings with double jungle cock on either side.

The Childers.—Tag, gold twist and golden coloured floss; tail, a topping, some teal and tippet; body, yellow orange and dark red pig's wool, broad gold tinsel; hackle, dark red claret and bright blue on shoulder; wing, a good lump of whitish tipped dark turkey and strips of bustard,

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and gold pheasant tail over it mixed with slices of blue, pale red, orange and yellow swan; head black.

The Claret.—Tag, gold twist and gold floss; tail, a topping and strips of blue and red macaw; butt, black ostrich; body, three turns of orange floss, the rest medium reddish claret pig's wool, stoutish gold thread; a light reddish claret hackle, commencing about halfway down the body, with a couple of turns of black hackle at shoulder; under wing a tippet feather, and over it mixed fibres of gold pheasant's tail, turkey, bustard, and peacock, fibres of green and red parrot thrown in, and one topping over all; ribs, blue macaw, and black head. Size of hook from 4 to 10 or 11.

The Guinea Hen is a specimen of a trimmed fly, *i.e.*, the hackle is trimmed or clipped from the breast, whilst at the back it is left to fall downwards, in order to form a part of the wing. Tag, orange floss; tail, a topping; body, medium blue floss; hackle, guinea hen, small speckled, laid on pretty thick and trimmed off the breast, silver twist; wings, gold pheasant tail and tippet, mixed fibres, with guinea hen and teal and yellow fibre; blue macaw ribs; head, peacock's tail.

Black and Teal.—Tag, silver twist and golden floss; tail, one topping; butt, black herl; body, two turns of orange floss, the rest black (either floss, horsehair, mohair, or unlaid sewing silk)—in large flies five is often used; broadish silver tinsel; black hackle, over three-parts of the body; gallina (the duck feather, with the large round spots, not the small speckled grey) on the shoulder; wings, double jungle cock, with topping over them, and two good-sized teal, or the small feather of the black partridge, one on either shoulder, to form a body to the wing; head, gold thread. This is Mr. Francis's own pattern of dressing the fly, and a good one it seems to be. It is one of the best ever used on the Spey or Tay.

The Namsen.—Tag silver twist; tail one topping, some red parrot and pintail sprigs; body roughish; two turns of bright yellow pig's wool, merged into deep orange, and that into medium red claret, and that again into bright medium, or inclining to darkish blue, upper part of claret and blue, tied in roughly for picking out, the blue the longest of course; silver tinsel with gold thread beside it; longish black hackle on shoulder; wing slips of dark turkey, bright bustard; bottom wing red, blue, and greenish dyed swan; head black. Size from 4 or 5 to 9 or 10. This is a peculiar species of fly. Tag gold twist; tail a topping, but two turns of peacock herl. The body is in three joints; the lowest is yellow, the middle one blue, and the upper one orange floss. At every joint there is a turn or two of peacock herl, and pointing downwards like a hackle are three or four of the small red feathers in the breast of an Indian crow.

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Fine gold twist, blue jay hackle at shoulder mixed, wing fibres of gold pheasant tail and tippet, bustard teal blue, yellow, and claret, dyed swan and a topping over all; peacock herl head.

The Britannia.—Tag, gold twist; tail, a good sized topping, a bit of scarlet ibis and fibres of Floriken; body, two or three turns of bright golden floss and then bright orange pig's wool; gold tinsel and silver twist, bright red claret hackle, bustard or wood-duck hackle over that, and dark blue or green hackle on shoulder, or rather as a ruff over the tiny underwing, a couple of shovel duck feathers, with from three to five toppings over it; two short purple cock feathers on either shoulder, and two shorter still kingfisher just below and over them at cheek. Size 4, 5, or 6.

The Goldfinch.—Tag, gold tinsel and black floss; tail, a topping; body, gold-coloured floss; hackle, pale yellow, blue jay at shoulder, gold tinsel, wing composed entirely of toppings, red macaw ribs, and black head.

I have thus given the chief of what I consider to be the most general effective flies after Mr. Francis's pattern of tying. There is, however, one other fly which I must not pass over, viz., *The Shannon*, which, if dressed after Fitz-Gibbons's method, is, according to my thinking, a much more beautiful fly than that dressed after Francis's. These are the directions of the former: Body, half light orange, half blue silk, to be ribbed with broad silver tinsel and gold twist, a lightish blue hackle stripped on one side over body, blue jay under shoulder; head, seal's fur dyed yellow, tag orange silk, above it another tag of fur of deeper orange hue; tail, large topping; wings, ten or twelve largish sized toppings, sprigs of the leading tail-feather of the golden pheasant, and four long feelers of the blue and yellow macaw. Hook, size No. 2.

Equipped with these flies the tyro may feel certain of sport in almost any salmon river. The total number used by salmon fishers on the various rivers defies enumeration. Each stream has its own flies, and to attempt a further list, therefore, as I have before intimated, would be to exhaust the reader's patience as well as my own, and in the end produce little result of a useful nature for those to whom this work is addressed.

The revolutionary ideas of Mr. Pennell on the subject of fly fishing will receive critical consideration when I come to talk of trout, for it is to that fish that his system especially applies. If the fanciful "arrangements" and "symphonies" in all the colours of the rainbow are numerous for salmon, they are increased tenfold in relation to trout. The difficulty which confronts the tyro in the selection of flies is consequently enormously added to. To imagine a system of fly making and selection which should reduce this number to specimens of a few in which "should meet the

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offices of all" were a "consummation devoutly to be wished." Possibly, thus urged and stimulated, Mr. Pennell set about the task in regard to both salmon and trout, with what success I am not now going to inquire. That the reader should have an opportunity of trying the three typical flies he gives as sufficient for salmon, I will give details of their dressing. As he is confident his system is right, and anxious to proselytise, I am sure he will allow me to add to my already great indebtedness by quoting the particulars referred to. He terms his flies the silver, gold, and rainbow, and this is the formulary:

Silver.—Tip, a single twist of the embossed plate used in the body; tail (1), tuft of jay's wing or any bright blue feather; (2) golden pheasant topping; butt, a twist of bright orangey yellow pig's wool; body, embossed silver plate; shoulder hackle, light blue hackle; wing (1), golden pheasant topping; (2) two feathers of jungle cock; (3) four long fibres from red macaw wing; head hackle (1), light orange hackle; (2) orange hackle.

Gold.—Tip, same as before; tail (1), tuft of small cock of the rock feathers; (2) golden pheasant topping; butt, a twist of bright crimson pig's wool; body, embossed gold plate; shoulder hackle, dark orange hackle; wing, same as "silver;" head hackle (1) blue hackle; (2) red orange hackle.

Rainbow.—Tip, same as above; tail (1), tuft of any light green feather; (2) golden pheasant topping; butt, bright yellow pig's wool forming part of body; body (pig's wool): (1) bright golden yellow; (2) red; (3) claret mixed with indigo towards shoulder; hackle at shoulder, light blue hackle; wing, same as before; head hackle: (1) orange hackle; (2) red hackle. The silver is sometimes observed on a double hook like the pike fly. This seems to be a good and certain method of securing the fish, but obviously it necessitates more force in striking, and therefore I think may be very readily dispensed with.

The merit, apart from his theory, which Mr. Pennell claims for these flies is that the colours are strong, glowing, and harmonious.

Very prettily he says, "As the harmonies of sound depend upon the combination of certain natural 'intervals' furnished by the harmonic chord, so, in forming harmonies of colour, the natural or prismatic arrangement as displayed by the solar spectrum of the optician must, in every case, be taken as a basis." On this principle are his flies as nearly as possible constructed, and certainly, so far as appearance goes, they are capital pieces of the colourist-flymaker's ingenuity.

The flies should be attached by a knot which will be shown, and only one, in my opinion—the stretcher—can, with anything like precision, be used. If there be sea trout about, however, a dropper suitable for them may be tied on, but in the event of two fish being hooked at once, as

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may occasionally occur, a breakage must inevitably ensue. I pronounce, therefore, for one fly only. Having, then, equipped my suppositious salmon fisher, the next branch of the subject demanding attention is the "throw" or "cast."

The art of "casting" a fly cannot be completely *taught* by word of mouth. I must presume in the following remarks that the angler I am addressing has *some* knowledge of casting a fly, say, for trout. For instance, he must be able to place his trout fly on the water without popping it nearly off behind him. No man should attempt a double handed fly rod till he can master the manipulation of a single-handed one. Such temerity would be absurd. Supposing, therefore, that he already knows something about it, I will proceed to describe the ordinary and best method—for there are more than one—of throwing a salmon fly.

First, one or two preliminary warnings. Do not try to get out 30yds. of line at first. Try rather with about ten, and in course of time the other twenty may be added. Do not use more strength than is necessary in making a cast. It is a lamentable waste of muscular power, and, after a time, as painful as it is wasteful, to exert all your force till the sound of the rod rushing through the wind makes noise enough for a miniature hurricane. Really, the secret of fly casting lies in doing as little yourself, and making your rod do as much, as you can. One of the advantages of the pliancy of a fly rod is its adaptability for this. The top of the rod and its immediate neighbouring parts, not the butt, are intended to aid the propulsion of the fly through the air. It is deplorable, therefore, to see a man exerting his whole strength in a strong breeze to get out some twenty yards of line, and to observe his failure in the energetic movement of the rod's butt, and the general resultant "cussedness" of the fly. Finally, never be in a hurry to get your fly out where a fish has just risen—"make haste slowly" is a golden precept.

In throwing the salmon fly, take the rod in the hands, one above and the other below the winch. In throwing from the right side, the right hand is to take the rod above the winch and the left below it. In making the left side cast, the positions are reversed; in fishing down a river from the left bank, the right shoulder cast must be made, and *vice versâ*. Of course, everybody knows which is the right and left hand bank of a river looking down stream. For the sake of an example, I will now suppose an angler fishing a stream down on the right. Of course, the left shoulder cast must be made, and I will further imagine cliffs or trees behind him. It is necessary that his cast shall avoid these, and this is how the thing is done: The rod is held aloft, with the left hand above the winch and the right beneath it as before noted; the left leg is placed forward, and the left side, of course, is towards the river.

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The rod is then brought round, by, over, and beyond the point of the left shoulder. This will carry the line to its full extent upwards and over the bed of the river. When so extended, the point of the rod must be brought back a little in the direction the cast is to be made. Making use, then, of the left arm chiefly, the line is propelled forward by a motion given the rod, as though there were something in the air you wished to strike. You must not now bend forward with the rod, or its forward motion will be checked at a short distance if you do, but keep your position, letting the natural pliancy of the upper joints of the rod do their work, and the fly will then fall as it ought, *first* on the water, followed by the gut and the rest of the line. The left shoulder cast is made chiefly when the obstructions I referred to exist. I can see no reason why the right shoulder cast should not be also used if the bank be shelving and the posterior surroundings clear.

The right shoulder cast is made oppositely, of course. The positions of the fisher as regards his feet and hands are reversed, and a bold semi-circular sweep of the line as before, bringing chiefly into play the muscles of the forearm, is made. No unnecessary strength should be employed. The body need not be bent, except to relax the rigidity of the muscles set for the throw. The fly then falls lightly and without hurry upon the stream, and is followed by the line quite as lightly. These straight shoulder casts are invariably the best, as they make the least noise and disturbance of the water, and they are certainly the easiest for the tyro to learn.

To vary the instructions necessary thus given for throwing with the salmon rod, I will quote Mr. Stoddart, himself one of the most expert of fly-fishers that ever handled rod. This gentleman says: "In fly-fishing for salmon the casting of the line is generally managed, first of all, by raising the rod back over the left shoulder. This part of the operation requires to be done slowly and deliberately, with a slight increase of speed or force on the part of the performer as he proceeds. He will then, if managing properly, raise the slipping or employed portion of the line above and behind him, so that by further elevating the rod and bringing it round over his head, both hands being employed in the exercise, he shall cause the tackle in question to describe, as it were, a sort of semi-circle in the air. He must then, at the moment the sweep in question is completed and the rod has attained its highest elevation, direct his fly forward by a rapid impulse towards the spot where he wishes it to alight; and this should be done without any accompanying jerk or violent movement, but solely by a firm continued exertion of strength, as in the 'putting' or launching of a large stone or cannon ball. This is the left shoulder method of throwing the salmon

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line, and is commendable, not so much on account of its being more easily managed than the other, but chiefly because of the advantage it gives the thrower when under a bank or in advance of scrubby ground. . . . But there is no reason why, under favourable circumstances, right-shoulder casting should not be resorted to. I think, for my own part, that the fly thrown from the shoulder generally alights on the stream's surface with greater lightness, and may be directed with more accuracy towards the desired spot."

I indicated, some time ago, that there were more ways than one of casting lines, and that the reader may not lack the information necessary to place him completely *au fait* with the subject, I extract from the "Rod and Line," a description of a third style, which is named the "Welsh throw." "The fly," says the author, "is brought as near you as the length of line will permit by drawing the rod almost perpendicularly, or inclining a trifle behind you either on the right hand or the left, immediately delivering the line before, while the fly and several yards of line remain on the water. The line in this case sweeps along the water, and the fly reaches the surface last. To accomplish this throw the rod must be well apportioned to the line. If the rod be powerful, so must be the line. If the rod be lighter, the line must be proportionately so, else to succeed is impossible; and without a line made for the purpose no one can accomplish the throw." I confess I do not quite understand this throw, nor see its advantages. It seems to me to be an exceedingly difficult and unsatisfactory one to make, but as I have never seen it made, I am quite at a loss to correct its faults. Mr. Francis gives a long scientific explanation, and a diagram expository of its principles. I recommend the novice, however, to eschew it until he has learned the legitimate and successful casts from the right and left shoulder.

There is yet another cast to be described, that is the "under cast." "In making these the rod is held forward horizontally, the hands and arms projecting in a line with the termination of the ribs. If the right hand is first, the rod is brought in a horizontal sweep to that side, and then urged sharply in an opposite direction." Casting in this way is not a very graceful or elegant proceeding, and resembles somewhat the childish throw to make "ducks and drakes." The winch line forms the "duck," and the gut casting-line the "drake." "Ephemera" strongly recommends this underhand casting. I certainly prefer it to the Welsh, or Spey, "slobbering" sort of cast.

All of these methods, however, are useful according to circumstances. Let no angler arbitrarily fix himself to a code of rules by which he will go, neither swerving to the right hand nor to the left. Each may

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be made subservient to the exigencies of peculiar times and seasons, or unexpected events, and thus are useful.

The working of the fly for salmon after it has fallen on the water requires tact, and tact only. This can only be derived from experience. The more salmon one catches, and the greater the variety of rivers from which they are taken, the more likely is the angler to work his lure pleasingly. He will recognise similarities of stream, and other indescribable niceties which guide his eye and inform his perceptions of the necessities of the water and their hidden prizes.

In drawing a fly along the water let us consider its appearance. The weight of the current, as it meets the fur and feather material of which the lure is composed, must compress these. If, therefore, the fly be steadily drawn against the stream its collapse is complete, and the chief of its attractions are hidden, those on the body especially, by the closed wings, which become themselves also attenuated and by no means conspicuous. The chances of a salmon taking the trouble to surmount the strong stream and follow up a questionable bait shorn of half its attractions are also small. Rather is it likely that the fish will relinquish the pursuit disgusted. "Ephemera" details several observations which lead to the inference that this is precisely what the fish do when the bait is drawn through the water without pause at a swift rate of progress.

Obviously, therefore, the proper thing to do is to so manage it when in the water that its appearance will be as attractive as possible, and that its pace will not overcome the curiosity or desire of the salmon by reason of the trouble necessary to gratify it. For it may be safely presumed that fish like as little trouble as possible in the pursuit of their object. Perch will always take by choice a wounded or hooked minnow, and this is chiefly because the exertion necessary is less. The motion imparted by the skilled salmon fisher to his lure is a sort of sinking and drawing movement, the "sinking," of course, opening the hairs or feathers of the bait to their full expansion. A fish often follows the bait, and this sinking is frequently the means of overcoming the "dare not" which waits upon "I would," and so compasses the ruin of the lordly "fysshe."

Notwithstanding the reasonableness of the idea that the fly should be worked as described, Mr. Francis characterises the notion as "all chips and porridge," and then allows that when the fish are capricious you work your bait anyhow; with "an undulation of the rod point, then an even draw; then a regular frantic witches' dance, bobbing and jerking and working as though your fly were possessed of St. Vitus or a tarantula bite." Now, Mr. Francis must know that a steady draw will not display the fly as well as the motion referred to, and his own experience is quite sufficient for him to decide upon, without calling to his aid somebody

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else's, as he does in the earlier part of the passage of which the quotation just given forms a part. Anyhow the reader may depend I am right in advising the sink and draw movement, and if he does not catch his fish with it he can play what antics he likes with his bait on the off chance. In conclusion, do not ever draw in too much, so as to lose command over the line. All fish seem to have an uncomfortable knack of taking you at a disadvantage, and so my advice is reduce your number of disadvantageous moments to the minimum.

Now, supposing you have risen and hooked your fish according to directions given about striking, the next question is how to play it. Of course, during the first rushes of a large, determined fish, it is absurd to try to stop it by any means of a really drastic nature. If it is at all advisable, for the sake of guiding the fish safely past a submerged rock or stump, I would recommend the rodster to use the butt; but ordinarily it is quite impossible to check it in its headlong rush. Usually it takes its way down stream, and this is always the best way for the angler, who should endeavour to keep up with it, never conceding one yard of line if his legs will obviate doing so. If he does so, and allows a long line to follow his fish, should the salmon turn and bolt up stream, the line lies looped in the water, and in all probability caught round all sorts of roots and branches, stones and stumps, of whose existence he has hitherto been in ignorance. Of course, the chances are, in such case, that the fish will sever connection without more ado. The right thing to do is to pursue the fleeing fish with all celerity, letting out just so much line as it requires, and will have, and no more. When the preliminary rush is over it will get more manageable, and now is the time to assert a little of your authority. If the fish shows a disposition to go over a fall or into a rapid or other place equally undesirable, where you cannot follow it, you must "butt" it. Do not do so, however, unless under the severest necessity. In this operation it is well not to present the butt too much in the direction of the fish, lest your middle joint snaps, as I have had one do, like a carrot. The only thing required is that the fish should be made to feel the check of the entire spring of the rod. This is done by placing the rod against the stomach, and holding it at about 45deg. A little more force gradually applied will do no harm, but the idea of reclining the rod over the shoulder is absurd, and simply means breaking one's rod in nine cases out of ten.

I am no advocate for brutally skull-dragging a salmon because one happens to possess good and strong tackle. I hold with firm but light treatment, and consequently the butting business in my case is seldom put into practice. I think most unhesitatingly that it is unsportsmanlike to deprive oneself of the magnificent play a fine fish

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usually gives. In no case, however, should an inch of slack line be allowed if it can be helped.

A wonderful lot of dodges have these clever fish when hooked to aid them in breaking away. When one is lightly hooked I notice he generally rises, and shakes his head about on the surface of the water. If he be impaled securely, however, he usually begins to fight under water, and violent indeed is his fury. Not that his advent above water is never made; far from it. In nine cases out of ten this acrobatic business is gone through, and the only thing to do is to lower the point of the rod when he springs, so that the weight of the pulling fish may not tear out the barb. "I have sometimes hooked a salmon," says Fitzgibbon, "and seen him to my dismay throw, in rapid succession, several somersaults, 6ft. high or more, and then with a species of ferocity plunge beneath the water, and there 'jigger away,' making the rod quiver as though he who held it were stricken with palsy. The somersault would be repeated, and finally the fish would have recourse to a lengthened rush. At length, after a protracted struggle, my quarry would yield and be bagged." This "jiggering" sensation is exceedingly unpleasant, and clearly shows that the fish has a good idea of how to get the hook out of its mouth by shaking and "champing" his jaws.

When a fish "sulks" there is only one thing to do—that is, wake him out of his bad humour as soon as possible by whatever means are the readiest to hand. Throwing stones at the spot of his going down, or even stirring him up with a long pole, may be resorted to. In general, however, *Salmo salar* may be roused by a few smart twitches of the rod's top, so as to make the barb of the hook felt. Be prepared for a determined rush, for a fish roused out of sulkiness is often excessively violent.

I will conclude this short homily on fly fishing for salmon by giving such directions as occur to me in connection with the most advisable way of fishing a salmon river, and where most fish are chiefly to be found. If convenient, it is better to fish up a stream than down, for reasons that will be given in the chapter on Trout, and from the fact that if a fish be hooked in the upper waters, ten chances to one but he will race down stream and upset the mental balance of every other fish *en route*. Always fish the water next you, then the middle, and then as far as you can throw without difficulty. Of course, there are often unconsidered trifles which seriously interfere with fixed rules, but either by wading or walking a stream a pool may be pretty nearly always compassed. I recommend the up-and-across throw, for it is just at the bend of the curve described by your bait when thus fishing that the fish usually takes one.

The best parts of the river cannot be easily detected to a certainty

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without recourse to the test of the rod. Some of the most likely looking spots are without fish, for some unaccountable reason or other, and *vice versâ*. A guide is always a safe investment, and if he be a thorough angler himself so much the better. It is in that case infinitely better to trust to his judgment than your own. If one cannot be got, it may be taken as a general rule that salmon—Dame Berners notwithstanding—do not lie out in the broad stream. They may be passing, but their resting-place is never in the open water. Like trout somewhat, they are likelier to be lying behind or amongst large stones, and on each side of sharp currents. Of course, where the current is not rapid, they will lie, like any other fish, in any part of the water. The boiling water underneath weirs is not to their taste, but where it runs swiftly and smoothly away, there may a salmon be found. "Ephemera" says, "In the early spring months, when there is a succession of fine open weather, salmon are found in all parts of pools, heads and tails, and if in the latter locality there be a large block of stone, forming an easily stemmed eddy, they will be found in it; because it is at the same time a good resting and a good feeding place. Salmon fight for such comfortable spots, the strongest and bravest taking possession of them, and when one fish is hooked and taken away another fish invariably fills the vacated locality. It is for this reason that a generally favourite spot is never without an aquatic tenant." And this is true of nearly all fish, and may be considered an axiom of unquestionable wisdom. "The best fish are found in the best places," no doubt in obedience to the majestic law of natural selection.

There are one or two other methods of fishing for salmon which must not be forgotten, particularly as they are suggested by both Berners and Barker in old time as having been the only kind—or nearly so—of angling for this fish. They are spinning and bottom fishing. I commence with spinning, as being the more important of these.

Spinning for salmon is usually by means of the eel tail, minnow, or artificial bait. The eel tail is remarkably effectual at times, and consists, as the reader is aware from my reference to it in the chapter on pike, of the tail of an eel, through which a leaded hook is passed. The tail is better for having been left two or three weeks in dry salt, which seems to increase its toughness and fix its colour to a pale blue. It should be soaked in fresh water for some hours before using. The minnow is also used occasionally on strong tackle similar to that for trout, but its success is by no means so marked as is the case with the eel tail. Artificial baits, such as the phantom, plano convex, and spoon, are useful in some rivers, but only doubtful praise can be awarded these methods as compared with the fly and fly rod.

The way of using the baits is almost identical with that pursued for

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pike, and, with the exception of the desirability of a rather longer rod for salmon, the same character of tackle may be preserved throughout. Of course it is not necessary to use gimp tackle, the ordinary single or twisted salmon gut being sufficient. Indeed, I question if this is not needlessly coarse. In my own case, the usual Thames trout tackle has been sufficient, and I fearlessly assert that he who can play a Thames trout can play and kill a salmon, the finesse and craft of a trout being, in my opinion, greater than that of its lordly congener, size for size. In working the spinning bait, a sort of sink and draw motion should be imparted to it. This seems necessary from the frequent capriciousness of the fish. A salmon will seldom pursue with the pertinacity we look for in a fish of prey.

No rigid rules can be laid down as to the best seasons for spinning for salmon. In the Tweed, April and May, and sometimes March, are productive, whilst in the Clare, Galway river, Ireland, it is said that the eel tail bait does not kill till late in the season. Generally, it may be used when a flush of water of too discoloured a nature to permit of the fly is coming down. I have known the spoon do great execution at such time.

Fishing with the worm is often remarkably productive of results. The tackle consists of the poly-hook arrangement for trout, or of one large hook sufficiently long and large to take two or three worms. The last worm should cover the hook, and the two others should only partially be threaded. These hooks should be attached to about a couple of yards of gut, and a swivel may advantageously be placed in its course to prevent a kink or twist of either the gut or line above when the bait rolls over and over on the bottom, as it must do to be effectual. Sufficient split shot, or, better still, one of my small sinkers, described in the chapter on Tackle, should be fixed about 2ft. above the bait.

There is not much difference in fishing with this bait from worm fishing for trout. The angler selects a pool where he knows the fish are to be found and leisurely works it. The symptoms of a bite are a nervous twitching of the line, and then often a complete cessation of movement. The fish is now probably gorging the bait, and sufficient time should in all cases be allowed him to take it well in his mouth. The strike is as decided and meaning as that in trout fishing, and in order to provide for emergencies, a yard or so of line should be held loosely, unless, indeed, the fisher uses the Nottingham reel, when the danger of a sudden rush is considerably modified.

Some very pretty sport may be got by reducing the orthodox coarseness of the worm tackle until it is but a size or so larger and stronger than that used for trout. I like the barbel rod and Nottingham plait line I use for carp, and with it have succeeded in capturing salmon

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under a bright sun, when the water has been excessively clear. In such cases it is a *sine qud non* that one fishes from below, up. This will be explained in the chapter on Trout, and is an important fact. Considerable dexterity is required, and I have seen a first-class salmon-fly angler completely nonplussed when I have put my light rod and lighter tackle in his hand for the first time. The worms should be well scoured in moss, and a few uncut may be scattered broadcast in the swim being fished. The real or artificial shrimp is also a good lure, and the prawn is, if anything, a better. Both may be used, as one uses a grasshopper for grayling, with the sink and draw motion. I have met with success on the Tweed by using a light quill Nottingham float, as if chub fishing. Altogether, however, I prefer dispensing with the float.

Having thus exhausted the subject of salmon with a brevity which in some instances may be deemed blameable, I pass on to its immediate relations, which head the next chapters. The futher detailed description of salmon tackle will be given in the section devoted to Tackle and Tackle Making.

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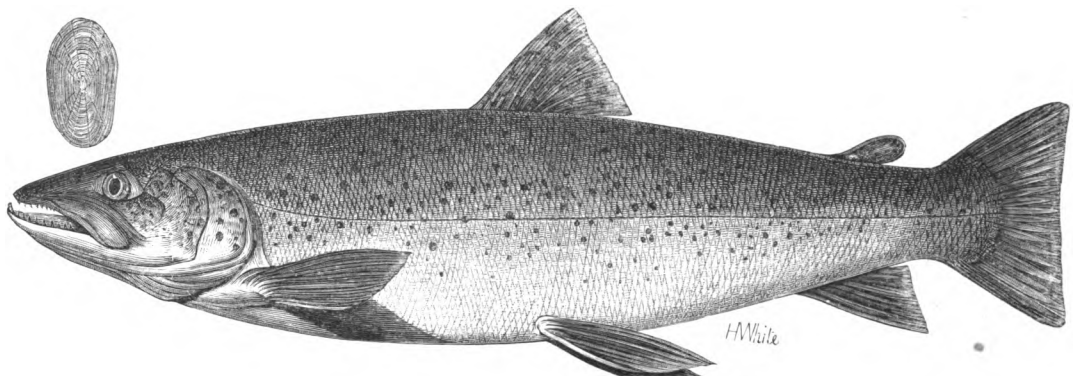

THE BULL TROUT—(*Salmo eriox*).

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CHAPTER XXIV.

THE BULL TROUT, GREY TROUT, SEWIN, OR ROUND-TAIL.

THERE has existed much diversity of opinion as to the identities of the *Salmo eriox* or bull trout and its beautiful brother *Salmo trutta*, or the sea trout, and each of these have been mistaken or otherwise wrongly mixed up with the true salmon—*Salmo salar*. The distinctions between them however, are very marked, as I shall proceed to show.

First, the form of the gill covers: those of the salmon almost in their outline describe a *semi-circle*; the gill covers of the bull trout a *blunt right angle*; and those of the sea trout a compromise between the two. Secondly, the teeth are differently placed and of widely different number in the sea trout from those of either of its relations, the *Salmo salar* and *Salmo eriox* being but slightly different, except in size. The teeth in the central bone of the mouth of a sea trout are numerous and extended along it, whilst these teeth are often not present in the salmon, having been lost during the first migration to the sea. The teeth of the bull trout are also *usually* longer and sharper than the salmon, or sea trout. Thirdly, the fins are, in the—

SALMON.	BULL TROUT.	SEA TROUT.
Tail Fin.	*Tail Fin.*	*Tail Fin.*
When young, deeply forked, almost like a dace (see Dace), less so about third year; and nearly square about fifth year.	Square earlier, then gradually convex (hence "round tail").	Shorter and smaller than salmon of same size, less forked than salmon of same age; becomes square at about six years.
Dorsal Fin.	*Dorsal Fin.*	*Dorsal Fin.*
Hinder origin half way between point of nose to extreme end of tail. Longest in third ray.	Begins about half way between end of nose and origin of upper tail fin rays.	Hinder origin *exactly* half way between point of nose and end of tail fin. Second ray longest.
Adipose Fin.	*Adipose Fin.*	*Adipose Fin.*
Hinder origin about half way between origin of last back fin ray and end of tail.	Nearer to end of tail fin than to origin of last dorsal fin ray.	Half way between origin of last ray of back fin and end of tail fin.
Pectoral Fins.	*Pectoral Fins.*	
Two-thirds length of head.	Half length of head.	

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In reference to the Bull trout I may add the following particulars: Scales rather smaller, and consequently more numerous than in salmon of an equal size; colour, upper part of head and body bluish black, lighter on sides, which are marked towards back with spots rather resembling stars—or, nearer still, the letter X. At spawning time the colours in the male become—head, olive brown; body, reddish or orange brown; in females the latter is a blackish grey. The fin rays are thus given by Pennell, to whom, indeed, I am indebted for most of the above particulars: Fin rays—Dorsal 11, pectoral 14, ventral 9, adipose 11, caudal 19.

I have thus given the individual characteristics of the fish.

The author of the "Modern Practical Angler," has classed this fish and its near relative, the *Salmo trutta*, together, when speaking of fishing for them. This is unquestionably a correct procedure, for the fish are caught together indifferently. The bull trout is the "Coquet" trout, and on the Tweed its presence is widely and acceptably known; and the fly which takes this fish will ordinarily take the other. I am disposed, therefore, to descant first on the natural history of the *S. eriox*, and then to pass to the *S. trutta*, to which my remarks anent fishing for both will be appended. The name sewin obtains in Wales for this fish.

Lord Home has given some distinctions in the habits of the fish whose name heads this chapter, which are very valuable. He says: "The bull trout has increased in numbers in the Tweed prodigiously within these last forty years, and to that increase I attribute the decrease of salmon trout or whitling—for the whitling in the Tweed was the salmon trout, not the young bull trouts which go by the name of trouts simply. The bull trout takes the river at two seasons; the first shoal come up about the end of April or May. They are then small, weighing from 2lb. to 4lb. or 5lb. The second, and by far the more numerous shoal, come late in November. They then come up in thousands, and are not only in fine condition, but of a much larger size, weighing from 6lb. to 20lb. The bull trout is an inferior fish, and is exactly what is called at Dalkeith and Edinburgh, 'Musselburg trout.' A clear bull trout in good condition is scarcely ever known to take a fly or bait of any description. It is the same in the Esk at Dalkeith. I believe I have killed as many—indeed, I may venture to say I have killed more salmon with the rod than any one man ever did, and yet, put them all together, I am sure I have not killed twenty clean bull trout. Of bull trout kelts thousands may be killed. The shoal of bull trout, not taking the river till after the commencement of close time, are, in a great measure, lost both to the proprietor and the public." Probably this fish is better known in the Tweed than in any other river. It is certainly not a common fish in this country.

The usual weight of the bull trout is from 9lb. to 14lb., and it rarely

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reaches twenty. When a fish of fair condition, of even 10lb., takes the bait, it makes a furious fight, and, darting in the most erratic fashion about in the water, it often renders itself a victor and the angler fishless. Of course from what Lord Home has written, it may be gathered that the bull trout, like the salmon, ascends the streams to spawn, possibly much earlier, however. It returns correspondingly early. It has not by any means so much strength in surmounting difficulties, and is in consequence apt to spawn in lower positions in the river it selects.

According to our most eminent naturalists, the fish is found in Devonshire and Cornwall. I have seen it from the Severn. It is caught in the rivers of S. Wales, and, according to Dr. Heysham, in some of the Cumberland rivers emptying into the Solway Firth. In Ireland it is remarkably plentiful. Annan, in Dumfriesshire, is mentioned by Sir W. Jardine as possessing it, and Sir Walter Scott, in the "Lay of the Last Minstrel," speaks of it in the Liddel :

> Billhope braes for bucks and raes,
> And Earit haugh for swine ;
> And Tarras for the good *bull trout*
> If he be ta'en in time.

The fish is often sold in London as salmon, and is esteemed in France above salmon ; why, I cannot tell. Its flesh is not nearly so fat and rich as that of *Salmo salar*, and its form is by no means so elegant. Its general appearance when it reaches the market is, however, somewhat similar, and, to the ignorant person, will readily pass for a salmon.

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CHAPTER XXV.

THE SEA TROUT, WHITE TROUT, OR SALMON TROUT.

THE sea trout, white trout, or salmon trout (*Salmo trutta*), is the last of the migratory white trouts, and is, perhaps, with the exception of the Thames trout, the most beautiful of all our salmonidæ, and the most active and vigorous. It may be said to rank as a food fish next to the salmon; indeed, by many persons it is preferred to the latter. The distinguishing marks which show its identity as compared with the salmon are given in the preceding chapter. It is not, therefore, needful for me to again enumerate them. This fish cannot by any possibility be mistaken for the golden trout, because of its essentially silver colour throughout, unless, indeed, it be confined to fresh water for any length of time, when its hue does approximate to that of the *fario*.

Both this and the *Salmo eriox* may be hatched and reared in fresh water, and I have kept them for three years with great accession of size and sporting quality. They will then rise at the fly in such a way as to suggest that it is their natural food, did we not know that the fresh-water ephemera, &c., are not found on and in the sea. In fact, it has been proved that the usual food of this fish is the sandhopper, with an *occasional* variation in the shape of beetles, flies, and other insects and small fish. When it enters the river it may be seen in shoals, almost rising to whatever seems to present an attraction, and it is then that tremendous bags are sometimes made. Ordinary grilse flies at such time do extraordinary execution, and Sir W. Jardine mentions an instance in which thirty-four fish were, under such circumstances, the produce of two rods in about an hour and a half.

Scotland supplies the London markets with great quantities of these fish annually, and a higher price than that given for salmon is not unfrequently obtained for them. The Perth, Dundee, Montrose, and Aberdeen

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fish are considered the best, the Tweed producing but very few. Lord Home, referring to the latter river, has remarked, "of this excellent species (*Salmo trutta*) I can only repeat that in the Tweed they have almost disappeared; they afford good sport to the angler, but I never saw one above 7lb. weight." The rivers Spey, Nith, Annan, and Esk, too, and some of those in Devonshire (where it is called a truff) are chiefly prolific of the fish in question. I have taken one also from the Severn, near Tewkesbury. It is identical with Walton's "Fordyce" trout, of which he speaks in such eulogistic terms as "rare good meat." Mr. Pennell says that specimens are occasionally taken in the Thames by shad fishermen above Putney Bridge in June and July, but I am unable, from questioning the local fishermen, to verify this. In the *Journal of the Royal Institution*, No. 34, p. 211, a Mr. M'Culloch mentions that it is found in a fresh-water lake in one of the islands of the Hebrides, where it has been in existence for a long time, and is breeding freely. This agrees with, and goes further than, my statement, that they may be artificially bred for lakes and streams not necessarily connected with the sea and permissive of the natural migration.

Though the size of these fish rarely exceeds 7lb. or 8lb., it is occasionally taken much larger. In 1840 it is said that a male sea trout was taken in the mouth of the Tweed, weighing 24½lb., and in 1846 one of 21lb. was presented by Sir R. Peel to Prof. Owen, from the river near Drayton Manor. Such sizes are exceedingly exceptional, however.

The tackle required for both *Salmo eriox* and *Salmo trutta* is of a nature partaking of the characteristics of both salmon and ordinary trout tackle—in fact, to use a common term, it may be said to be a "cross" between the two. A grilse fly, for example, if not dressed on too large a hook, will serve for either of them, and the fish may be killed sometimes in quantities with either or all of the standard flies given for salmon, if size be reduced. It would seem, however, that a nearer approach to the natural fly is desirable in white trout imitations than is thought necessary, or is indeed possible, in flies used for salmon. The flies should also be dressed on loops of gut or fine silk plait line; this procedure greatly increases their lasting power. I have, indeed, used a fly thus tied for half the season, and had fair sport, without having had occasion to change it on account of its loss of strength in the connection between it and the main line.

Mr. Francis gives from experience a list of flies which, like everything emanating from his pen, is copious and exhaustive. It is impossible for me to compete with his long experience in this matter, and I therefore venture to name a few of the lures referred to by this author, honestly acknowledging my indebtedness.

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The following is said to be an excellent all-round fly either in Scotland, Ireland, or England: Tail, a short tuft of orange yellow floss silk; body, a dark ruddy brown or brown red pigs' wool, fine silver twist hackle, coch-y-bonddhu, red with black centre; wing, two strips of bright teal. *The White Tip.*—This is also a standard Tweed pattern. Tail, short orange floss; body, black ostrich herl, silver thread; hackle, dark coch-y-bonddhu, with only a little red at tips of the fibres; wing, two shreds from the black and white wing feather of a wild drake, three-quarter black and quarter black and white tip. *Another Pattern.*—Tail, short golden floss; body, ruddy orange, gold thread; red hackle, with a scrap of black at the butt of the feather; wing, the brown speckled feathers from a woodcock's tail or the rump of a brown speckled hen. Hooks, of all, moderate size.

The above flies are dressed by Jamie Wright, of Johnstone, and, probably, may be procured from him, with the addition of several other sorts not here named.

West of Ireland Flies.—No. 1: Tail, a whisk from the cock of the rock's breast feather; body, light claret red pigs' wool; hackle, the same, fineish gold tinsel under wing, a fragment of golden pheasant tippet, over it brown mallard; black head. Medium size hook. This is said to be a wonderful killer. No. 2: Tail, sprigs of golden pheasant, tippet, and teal; body, dirty reddish brown, almost the colour of dark cow's hair, gold thread; red hackle, with a black butt to it from shoulder; wing, mixed bustard, predominating with fibres of gallina, two or three sprigs of golden pheasant, tippet, and ground feather, with peacock's breast; head, peacock's herl. Large size hook. No. 3: Tag pale blue floss; tail, sprigs of golden pheasant tippet and fine blue macaw points; body, golden yellow floss, gold thread; hackle, dark olive with one turn of tag at shoulder; wing, mixed golden pheasant tail and tippet, brown mallard and gallina; head, black; small size. These three flies may be easily made, and are not expensive if bought. They are, in addition to these advantages, sure killers.

I refrain from adding to the list, because I am persuaded that the ordinary white trout angler will prefer purchasing the local flies or dressing his own from local patterns, and, as I have before observed, these vary in a remarkable degree. They also are, with the exception of the chief and standard sorts, as changeable as the wind.

Before passing from the subject of fly fishing for sea trout, it is necessary that I should again refer to the views of that heretic fly fisher, Mr. Pennell. The principles of which his typical flies are the outcome, of course, touch the sea trout as well as the salmon. That the angler may have a chance of comparing his lures with those given from

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Mr. Francis I append the formulæ. The variations in size of hook will be best learned by experience on the lakes or rivers fished.

(1) *Green:* Hackle, dark green; body, darkish green, sewing silk lightly waxed with colourless wax; whisk, cut end of hackle. (2) *Brown:* Hackle, fiery or cinnamon brown; body, dark orange silk, well waxed with cobblers' wax, and then drawn lightly between the fingers; whisk, cut end of hackle. (3) *Yellow:* Hackle, darkish golden olive; body, golden yellow sewing silk, lightly waxed with colourless wax; whisk, cut end of tackle.

These directions are simplicity themselves, and so are the flies. With a few fine grained feathers and Judson's dyes, the tyro can fit himself out to a nicety in a few hours.

I pronounce no opinion at this time on these flies or the theory which governs them. These points will be carefully discussed in the chapter which follows.

Of course one can spin or worm-fish for these white trout, but as a rule it is slow work. A basket may be often filled, however, by spinning with the natural or artificial minnow, and the method of worm fishing pursued for salmon is often very killing. Personally I prefer the fly, however, but as the fisherman should not be above any device which does not violate the canons of sport, I recommend the carrying of all three kinds of tackle, that no exigency may interfere or opportunity be allowed to pass.

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CHAPTER XXVI.

THE COMMON BROWN TROUT.

MR. RUSKIN tells us that the blue eye, gigantic strength, and chivalric bravery of Richard Cœur de Lion in the minds of his adoring soldiers were abstract reasons why he should be king. If this be so, for similar reasons we are justified in pronouncing our acknowledgment of the dignity of the *Salmo fario*, whose beauty, courage, and strength are, taking size for size, unequalled by any compeer.

There are two other distinct species of golden or yellow trout, and these will be hereafter carefully dealt with. The Wick and Chess trouts are the close relatives of the Thames and ordinary brown brook trouts, and may be safely comprised under the title of *Salmo fario*. It may be remarked that many of the distinctions drawn between the fish of different rivers are rather local than reliable, and serve rather to confuse than classify. For all practical purposes, therefore, the common brown brook trout may be said to be identical with all the trouts of our rivers and streams, including the Thames fish heretofore alluded to. Of the imported American (*fortinalis*) trout I do not deem it necessary for practical purposes to here consider.

Probably, the first thing which attracts attention when a number of trout are seen together is the difference in colour which exists (especially in summer time) between them. This has been accounted for in various ways; but the true cause, in many cases, is, and must remain, undiscovered. I, however, suspected that the amount of light which fell upon the fish was one of the principal causes, and organised in consequence a series of experiments for the purpose of determining this. The result proved my suspicion, for it was possible to completely change the complexion of a fish in two hours from a deep olive to a ghastly grey colour, by a proper management of the light. The difficulty to be got over, however, was the fact that many apparently healthy fish, in direct

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sunlight, are, in their native stream, sometimes light and sometimes of a dark hue. In truth, the variation seemed to occur often with no visible reference to the effect of light. By the aid of the microscope, however, the result seemed that, although the sunlight certainly could produce an alteration of hues, yet the pigment cells under the skin were chiefly affected in all cases by the health of the fish. Perfect sterility accompanied some of these visitations.

A remarkable example of this variation is given by the author of "Wild Sports of the West." "I never observed," he says, "the effects of bottom soil upon the quality of fish so strongly marked as in the trout taken in a small lake in the county of Monaghan. The water is a long irregular sheet of no great depth, one shore bounded by a bog, the other by a dry, gravelly surface. In the bog side the trout are of the dark and shapeless species peculiar to Moorish loughs, whilst the other affords the beautiful and sprightly variety generally inhabiting rapid and sandy streams. Narrow as the lake is, the fish appear to confine themselves to their respective limits, the red trout being never found upon the bog moiety of the lake, nor black where the under surface is hard gravel." This apparent stop-at-home instinct in the fish is, of course, accounted for easily. The fish undoubtedly observed no arbitrary limits, but when they had migrated and remained a short time over a different coloured strata the colour no doubt changed, as in the case of the minnow (described in the chapter on that interesting fish), and thus deceived the angler into supposing them non-migratory.

The impetus which has of late years been given to the culture of the salmonidæ of necessity renders it almost impossible to say anything *new* on the subject of the personal history of this fish. A brief *résumé*, however, may be desirable. Trout generally are very fecund. Notwithstanding the sterility of some, through the enervating effects of disease, the trout, in a greater percentage of cases than any other fish, deposits its spawn healthily, and with strict reference to a code of instinctive rules from which it seldom deviates. Its spawning season varies greatly with the mean temperature of the year. Sometimes the breeding may be said to begin in some rivers as early as the end of August; on other occasions the ova is not deposited until January. In each situation, however, a regular procedure is gone through. Like the salmon, the female, as the period of gestation seems approaching its termination, ascends the stream, surmounting obstacles of all descriptions, until a suitable position is reached, when she commences turning up the gravel as might a hog. The male fish are seldom far behind, and many and deadly are the combats which frequently take place between them for the honour of assisting in the operation of making this bed. On several occasions I myself have

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witnessed battles of incredible fierceness, in which the combatants have rushed at each other like bulldogs, inflicting wounds of considerable severity. Then, with loving and evident amity, the operation of spawning in all its completeness has proceeded without reference to the vanquished. That an awfully decimating influence is continually at work on the deposited ova exists beyond a doubt, and the presumption is allowable that not more than one-thousandth part of it ever reaches the maturity of a parent fish, having passed unscathed through the perils of incubation, alevinage, and hobby-de-hoy-hood, and the vicissitudes of adult life to the period when reproduction commences. There are many causes for this. When lying hidden in the gravel of the stream its living enemies are legion. To say nothing of the ravages sometimes inflicted on the spawning beds by old unfecund cock trout, whose appetites, like the Bengal man-eating tiger, are depraved by age and senility, some of the water animalculæ are terrible scourges. Our old friend the *Pulex gammari*, useful bait as he undoubtedly is for the very fish whose ova he destroys, is perhaps the worst of all. The larvæ of various beetles, of the *Dytiscus marginalis* especially, are very destructive. The larvæ of this same *Dytiscus* usually yclept "the water devil" will even attack young fish. "The manner," says Dr. Lardner, "in which it deals with its prey shows extraordinary intelligence . . . . when it attracts the notice of the larva the latter accomplishes its object by swimming under its intended victim; when sufficiently near, turning its head upwards, it seizes its prey between its jointed antennæ. Having thus secured it, it stabs it in the belly with its sharp mandibles, so as to disable it, then rises to the surface of the water, and, holding its victim above the water so as to (partially ?) prevent its struggling, shakes it as a dog would a rat."

I have seen this so-called water devil tear open an ovum and deliberately proceed to devour its contents, which it did with great apparent gusto in a wonderfully short space of time. The larvæ of the family of the Libellulidæ, popularly known by the name of horse stingers or dragon flies, are also inveterate destroyers of trout ova. I had one in my possession almost 2in. in length, which, when caught, had completely gorged itself with perch spawn. The *lurco*, or glutton (the larvæ of the naid), may also be placed in the foremost ranks of such enemies of the trout, on all of which *Salmo fario* revenges himself by devouring them during some part of their existence for his own maintenance, which reminds one of Hamlet's quaint conceit ("Hamlet," act iv., scene 1): "A man may fish with a worm that hath eat of a king, and eat of the fish that hath fed of that worm."

The young of all the salmonidæ are liable to a certain fungoid growth, which is analogous to the salmon plague, and is usually termed the "gill

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fever." It carries off immense numbers during the time when they are absorbing the umbilical vesicle, and immediately after. The actual cure is not discovered yet, for the reason that the cause is unknown. Notwithstanding this, the progress which pisciculture has made is remarkable and worthy of all credit.

The foregoing remarks apply to Thames trout as well as the ordinary fish, notwithstanding the contention that this splendid specimen of the genus is a salmon trout or cross-bred fish. Indeed, Mr. Buckland failed in his attempts in 1864 to produce a cross at all. I do not, however, assert that such an event is an impossibility, but I am convinced, from careful examination of structure and habits, that the Thames trout is a *Salmo fario*, distinct from his smaller brethren only on account of size and pluck.

In order to render the identity of the Thames trout with this species more marked, just compare him with the *Salmo trutta*, or the great lake trout (*Salmo ferox*), or the bull trout (*Salmo eriox*), and the dissimilarity is as apparent as his likeness, ichthyologically, to the brown trout is plain, especially to the trout of the Wick. Strangely enough, however, at precisely that weight which other trout rarely attain the Thames fish begins to grow, apparently. It is seldom one gets even a Chess, Colne, or Wick trout above 3lb., and it is rare that the Thames trout is caught below this standard. A few recorded weighings of captured Thames trout occur to me at this moment, which will serve to show the capacity for growth possessed by this fish. Yarrell speaks of one 15lb. caught in 1835. There is one at Marlow, at a well-known hostelry, which scaled quite 16lb., I should think. In May, 1877, one was caught at Marlow which weighed 10½lb. On May 31, 1834, one was caught by Sir Samuel Hawker which weighed 14lb.; and some years ago a Thames trout was picked up at Weybridge which scaled 23½lb., though out of condition. That this was a veritable trout I feel certain, although Mr. Buckland has thrown doubts upon it. There are peculiarities about it which are not to be perceived in connection with the salmon. Its length was 40in. and girth 22in. As old age creeps on the Thames trout it seems to grow deformed, like some bird of prey, about the muzzle or beak, so that it cannot eat. I think the average limit of size for a Thames trout is about sixteen pounds.

By the Act 1 Elizabeth, cap. 17, no trout are allowed to be taken in the Thames measuring less than 8in. from eye to fork. The legal Thames close time for this fish is from the 10th of September to the 25th of January; but the Thames Angling Preservation Society have wisely extended it to the 31st of March, a very proper regulation, which is seldom infringed by respectable anglers.

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The ordinary *Salmo fario*, when in season, is an exceedingly handsome piece of water-going architecture. This is how Ronalds describes him: "The back fin has a pale brown colour, with dark brown spots upon it; the others (including the tail parts) have a red tint. The colour of the back when in perfect condition (which is generally in May, but in some waters not until June), is usually a dark olive green studded with a mixture of black and brownish spots. The sides are shaded off from the olive to a greenish yellow studded with red spots; the black spots gradually vanishing. Lower down the yellow tint approaches a salmon colour, and the belly is nearly white, without any spots." I think my piscatorial readers will agree with me that this is as precise as it is possible to be. Out of season the fish is inclined to be dark, and its shape alters markedly, becoming lank and meagre.

Having described and generally remarked upon the common trout of our brooks, and its superior brothers, the Colne, Wick, and Thames trout, it now becomes necessary to advert to the other varieties of the brown trout which have been noticed and commented on by our ichthyologists, but which are not sufficiently distinct to warrant separation under new generic titles. Sir W. Jardine is chiefly responsible for the detailed difference I am about to name, and although these distinctions unquestionably exist, it may be borne in mind, as a fact of undeniable comprehensibility, that they are not sufficient, when taken from a strictly scientific point of view, to justify anyone in concluding that their significance indicates anything more than "sports," or variations, for which geological strata, climatic peculiarities, and other causes are directly responsible. This rule has but few exceptions; one of these occurs in the case of the deformed trout of a small loch, called Lochdow, near Pitmain, in Inverness-shire. "Their heads," says a writer in the seventh edition of the "Encyclopædia Britannica," in the article on angling, "are short and round, and their upper jaws are truncated like that of a bulldog." Of course, even this deformity is not sufficient to exact a new classification of the fish.

The varieties of trout described by Sir W. Jardine commence with that which is found in Loch Craigie, the country round which is formed of black and white granite. The colour of the water is a clear senna brown, and more limpid than that of any of the lochs of the same district. The fish were said to be of good size and very symmetrical, small sized head, and full arched back, and their colours were peculiar and beautiful. The upper part was of a rich brown, the lower half and belly of a deep golden orange, the spotting abundant but ill-defined, and often of a cruciform shape; the flesh very highly coloured. Couch remarks that in the parish of Luxilian, in Cornwall, there are trout amid like surroundings

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of a description almost precisely similar. Undoubtedly strata has had a great deal to do with the difference in these examples.

In connection with the trout of Luxilian there are one or two remarkable circumstances quite worthy of notice here. It appears that the pools are in the open country, and unconnected with any river or stream, seeming, in fact, to be formed from pits or hollows, excavated in past time for the purpose of working tin; how the fish got in these can hardly be guessed at. However, there they are, and their appearances are divided into two sorts. The first specimens have the anterior margin of the dorsal fin, and also the adipose, red; the upper and lower portions of the tail not rounded, and both margins red, with no bright line on the anterior border of the anal. In the second case and larger fish, there are no marks of red on either body or fins; there is a slight tinge of yellow on the cheeks, and on the body some cross-shaped marks; the points of the tail are rounded, and the anterior of the anal fin is faintly white.

Sir W. Jardine's second variety was found in Loch Shin, about three or four miles from Loch Craigie. The water is a very deep brown colour, and the bottom is gravelly, rocky, and sandy, and its banks are mossy. The trout are well-conditioned fish and of somewhat longish appearance, though not, therefore, ungraceful. On the contrary, the specimens I have seen present lines of great beauty. The characteristics of the fish are widely different from those of the foregoing, however. The fins are all lengthened in comparison, and sharp pointed and presumably powerful; the dorsal rises high in front, and the first ray of the anal fin is double the length of the last. The configuration of the scales is also longer and narrower in proportion than that of any other. The hues of the fish are by no means as brilliant as the first-named variety; the spots are full and round. It will thus be seen that a considerable difference of general appearance obtains between these two specimens alone.

The third variety given by this naturalist is from a small loch on the Barnnie range, of very considerable elevation. The strata is limestone, and the water of a dull tint, though clear; the banks are mossy. In comparison with either or both of the two preceding, the nose or muzzle is blunt, the length to the extremity of the gill-covers great in proportion; the body very thick and round; fins stalwart and muscular; the tail square. The prevailing colour is a purplish olive, shading from greyish to golden-yellow, the whole, including fins, tinted with a rich sheen of pale purple. The spotting is remarkably beautiful. Round sepia spots in a pale square predominate in the upper part of the fish; lower, they are thinner and more scattered. The quality of the flesh is very good, being red, and firm in colour and texture.

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The fourth variety is a small kind, plentiful in Ossyth, in Sutherland. It is thickly formed, the fins of the usual length, and tail much forked; upper parts of an olive brown colour; a light yellow belly. The upper two-thirds of the body are covered with large round black spots in a pale circle.

In the fifth and last of the varieties referred to the body is comparatively short, but very deep; the fins are short and tench-like, and the head is remarkable for its great length. This fish is from lochs of the river Laxford, which runs from Loch Strach. The colours are not very bright; the spots are large and widely apart; the flesh white and dace-like. Couch remarks that from the divergence from the ordinary *Salmo fario* of the formation of the head bones, it might be considered a new species. But I do not thus consider it. I have seen specimens of this trout, and although the differences noted unquestionably exist, I am by no means ready to award it the dignity of separate position.

The various distinctions between the trouts referred to by Sir William Jardine may be added to in the case of the "Botling" trout of Wastwater, Cumberland, which, according to Yarrell, has been taken of 12lb., and has been identified by Dr. Davey as a trout. It is a fierce and voracious fish, and ascends the lake streams each autumn, attacking the other members of the salmonidæ with incredible ferocity. It is in shape a short, thick fish, whose girth is commonly in excess of its length. The ordinary lake trout resembles it very closely, and its dentition is said to be similar.

Besides the snub-nosed species of trout mentioned in a former paragraph, there are other peculiar deviations from the natural order of things chronicled by observers, which I may mention. So very long ago as the twelfth century Giroldus Cambrensis notices a peculiar sort of trout with only one eye—the right. This curious half-blind fish was found in the Llyn-y-Cwm of Wales, and the same was said of the perch and eels found in the same pool. This story has had the advantage of corroboration of one or two reputable writers and observers, viz., Mr. Hansard ("Trout and Salmon Fishing in Wales,") and the Hon. D. Barrington.

Trout with remarkable distortions of the spinal column into an arch at the region of the dorsal fin are reported from this same lake. Of course I am unable to verify the truth of this, or account on the score, say, of geological formation, for the abnormal development of the fish. The fact remains, however. The river Eynion, in Cardiganshire, according to Dr. Fleming, furnishes equally strange distorted fishes, and his assertions are surely uncontrovertible. Couch, equally veracious, says he obtained specimens of humpbacked trout from Caldew, in Cumberland, "where

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they are common," he adds. He also gives particulars of an extraordinary distortion or deficiency in the trout found in Malham Tarn, Yorkshire, specimens of which he obtained from Mr. Morrison, M.P. The situation of the water is 1200ft. above the level of the sea; the strata is limestone, and the water clear. The fish are called silver trout, from their appearance; and there is another species in the same water, which he does not doubt to be the lake trout (*S. ferox*), of which the colour is yellow. This silver trout is of the ordinary size of its species, and fairly well conditioned, and the peculiarity consists in the absence of the opercula on either one or the other sides of the head, sometimes, indeed, on both, so that the branchia or gills are open to the water and unprotected. He remarks that about four or five trout were caught exhibiting this peculiarlity, and these did not seem to have suffered any inconvenience. Yarrell speaks also of a trout having a separate head and tail, and Thompson, in the "Natural History of Ireland," mentions other malformations and similar ones to those already referred to.

It may, indeed, be said that the salmonidæ are more liable to monstrosities than any other fish, and trout are the most liable of the salmonidæ.

It is quite as well that the angler should be able to distinguish the male from the female trout, and for this purpose I give the following particulars. In the male the head in front of the eyes is always more lengthened than in the female, giving the fish an unfailing appearance of superior size in that part of the body. Towards spawning, also, the size of the abdomen sensibly increases, and the curve of the upper part of the body is more pronounced in the female. A little close observation of the unnameable peculiarities which exist to render the appearance of the sexes different will soon enable the angler to pronounce with celerity and certainty on the sex of any fish brought before him.

The range of habitat of the trout, like that of the rest of the salmonidæ, is very wide. Within a certain range of temperature its acclimatisation, if it does not already exist, is certain of success, and its growth and multiplication sure. Sir J. Malcolm found it in a stream of a mountain in Persia, and Heber observed it amongst the Himalayas. On the other hand, Parry found it existing in a lake in Melville Island, where the temperature falls many degrees below zero. It is well known that it now exists in comparative plenty at the Antipodes.

The food of trout is of great variety, and consists chiefly of insects and worms. The fish is not herbivorous. It is considered, and with considerable show of reason, that the blood or vital fluid of much of its insectivorous prey may go far to account for some of its peculiarities of colouring. The plausibility of this lies in the fact that the juices of

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some insects, such, for instance, as the ant, consist largely of formic acid. However this may be, it is certain that the most fattening food for tame trout is not that which is artificially prepared.

The question has been raised as to the possibility of the non-migratory trout living in salt water. I can confidently assert that they will, for sometime ago there was a good *Salmo fario* living with some smelts in salt water at the Brighton Aquarium. Mr. Lawler (the naturalist) told me it did not appear so lively as in fresh water, but that during its confinement it grew, and it fed voraciously. The tints of the fish appeared to have become brighter.

The longevity of trout, like that of any animal, is difficult to pronounce upon. A farmer near Pontypool is said to have kept one in captivity twenty-seven years, during which time it had not increased in size. Daniel, in the supplement to his "Rural Sports," speaks of one living twenty-eight years in a well at Dumbarton Castle, and Yarrell refers to one said to have existed fifty-three years at Broughton-in-Furness. The probable age to which Thames trout attain is from fifteen to twenty years.

The gillaroo, or gizzard, trout has been "hastily" (according to Pennell) named as a different species of trout. I do not think that there has been much hastiness in the proceeding, seeing that Davey, Yarrell, and Couch name its differences from the *S. fario* in detail, and each appears to regard its identity as completely differing from that of the true brook trout. That the differences I shall recapitulate really do exist there can be no doubt, but it may be a question whether they are of sufficient importance to elevate a variety into a species.

Sir Humphrey Davey, in "Salmonia," refers to it at length, and, from what he says, it seems that in appearance it differs from the *S. fario*, in that it has more red spots and a yellow or golden coloured body and fins, and generally presents a thicker and more robust appearance. The stomach is the feature which has attracted attention and gained a separate name. Its form has been improperly likened to that of a fowl's "gizzard" the consistence of which, being very thick as compared to that of the organ in other fishes, has given it the prominence referred to. "If it be the common trout, after all," Sir Humphrey says, "they have been altered in successive generations."

The great anatomist, John Hunter, distinguishes the stomach of this fish from the "gizzard" of poultry, since it wants some of the powers with which that organ seems chiefly endowed. For example, it has no bony cuticle, and thus the grinding qualities of a gizzard are not given it. Its capacity is circumscribed, however, as compared with other fish, and it has been conjectured that this is for the purpose of facilitating

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the disintegration and digestion of the shell fish on which this trout seems to feed most usually. But this organ can hardly possess a grinding power, because of its interior surface being lined with a fine yellow coat, which is by no means fitted for mastication. The ordinary trout differs in this feature so much that its stomach coats are not so thick by two-thirds. Professor Owen has examined the fish, and thus speaks of it (Lectures 1, 234): "It is the ascending or pyloric half of the heart or sipteral stomach that has its muscular parietes unusually thickened, by which it is enabled to bruise the shell of the small fluviatile testaceans that abound in the streams to which this species of trout is peculiar."

Ordinarily such a marked difference in the anatomy might entitle the fish to claim itself as a different species; but my idea is, that a slight structural change through successive generations, originated by an accident of food, has been gradually built up and confirmed till the structure of the fish has become as we find it now. Yarrell gives the fin rays of the gillaroo trout as follow: Dorsal 12, pectoral 12, ventral 9, anal 11, caudal 19, vertebræ 56. It may be added that Pennant looked upon this fish as only a variety. It is found chiefly in Ireland, but Couch says it has been taken in Sutherland and at Wick.

The colours and general appearance of this trout are thus described: Depth of specimen in front of dorsal fin, 2¼in., rising higher at the back and deeper at the belly than the kindred species, compared with which the under jaw is shorter and much more feeble, the snout more obtusely rounded, the setting on of the pectoral fins thrust more forward under the plate which borders the gills, and which is turned up to give them place; the pectoral and ventrals also proportionably larger, the anal rather smaller, the tail less expansive. The ordinary colouring is as follows: On the head brown, bluish brown along the back, higher portion of the sides tinted with pink, verging into yellow, and on the belly white; cheeks yellow; pectoral and anal fins yellow, also dorsal, dusky, with black spots and pale anterior border, adipose fin dark with black spot. Vermilion spots are scattered over the sides of the fish, with no reference to the lateral line, or very little. The flesh is a rich salmon colour.

Before passing from the general history of the fish, perhaps I may be allowed to quote from that curious poem, Mickle's "Syr Martyn," in reference to the metamorphosis of the trout:

> For once she lived a nymph of spotless fame
> In an obscure retreat, and Truta was her name.
> It chanc'd that in a flow'ry path she stray'd,
> Where a clear river with the pebble play'd,
> And just disturbed the silence of the shade.
> Truta, now seated near the spreadingtrees,
> Enjoys the coolness of the passing breeze;
> In the clear stream she casts her modest eyes,
> And in a fillet her fair tresses lies.

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While in this solitude she thus remains
And dyes her beauteous face with various stains,
It chanc'd the robber Lucius thro' the shade,
With eager eyes perceived the lonely maid;
He saw and lov'd her riches, on her face,
For both her dress and form appear'd with equal grace
The nymph now heard the rustling with affright;
She saw a man and trembled at the sight;
Swiftly along the winding shore she fled,
And cry'd, and vow'd, and call'd the gods to aid.
Truta, despairing, sought with trembling speed,
A rock that overlooked the wat'ry mead;
Hither she bent her course, the summit gained,
And thought her virtue now might be maintained
Cheaply with loss of life: while here she stood.
And just prepar'd to leap into the flood,
Lucius approach'd, and while he held behind
Her flow'ry vest that fluttered in the wind,
Chang'd into fish, an equal fate they bore,
And though transform'd in shape, yet, as before.

And this is how Randal Holme, in that marvellous book, the "Academy of Armory," speaks of the same fish: "Trout are emblems of quiet, calm, and gentleness, such as love not to be in troubled waters or to be tossed to and fro by the blustering of wicked and manevolent spirits, but rather live quiet at home than enjoy abundance through labour and trouble."

Trout fishing has, probably, excited more controversy than any other branch of fishing. I shall here divide it into three grand divisions, viz., fly fishing, worm fishing, and bait fishing. The term fly fishing comprises the artificial bait and its living prototypes. The so-called worm fishing includes not only the natural lob and red worms, but any living bait except fish. The bait fishing implies fish baits only. I make these not very convenient distinctions for the benefit of the tyro's memory. I will first refer to fly fishing.

Little can be added to the plenitude of the praises which have been so lavishly expended on fly fishing by the hundred and one writers on the subject. This style of fishing, when pursued for trout, is undeniably the chief sport afforded by fresh water. Each other style of fishing may, and undoubtedly does, possess claims which, to the specialist, seem to exceed all others, but no fish combines in their pursuit the same elements of enjoyment comprised by fly fishing for trout. The uncertainties of weather and water, the niceties of preparing for the fishing, and the various methods in vogue for capture, absorb an amazing amount of interest, and cover a much larger ground than is the case with any other fish found in our streams and lakes.

The rod first claims attention. It is always advisable, whether in selecting a rod for fly-fishing or not, to decide upon one which in some sort agrees with the stature and strength of the person using it. It should in no case be too long, and over weight is an equal fault, which the experienced fly-fisher will never fall in with owing to his proper particularity on the former points referred to. A rod of 14ft. is for trout

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fishing quite long enough, and one of 12ft. is generally thought sufficient for any purpose. If, however, the user be tall and strong, a 16ft. rod may not be out of the way for fishing broad and rapid streams. The best materials for a fly rod, in my opinion, are ash, lance, and bamboo, but full consideration will be given on this head in the forthcoming chapters on tackle making. Not only also is it necessary to pay attention to the weight and length of the rod, but it is of much higher importance to secure one with perfect taper, and in which the weight *in the hand* is reduced to a minimum. An illustration of what I mean may be gathered from the hunting field. As I think I have before mentioned, it is a known fact that some riders burden a horse actually pounds less than others not so skilful. Thus with a good rod; in the hand its perfect balance is at once appreciated, and one has the satisfaction of knowing that weariness in its use comes not from a fault in its construction.

A rod should never be too weak in the middle, says W. Bailey, of Nottingham, and he quotes an incident which proves the necessity of attention to this point. The author of the "Angler's Desideratum" says, "it (the rod) ought never to be less than twelve to sixteen feet, not bending at the top when held horizontally, but, on the contrary, standing out gracefully from the root to the tip, tremblingly alive to the slightest motion of the hand, vibrating and felt by it at every throw; it ought not to be supple in the middle nor stiff at the root." Some authorities advocate a stiff rod because of its "great superiority in casting" (Stewart) and striking, and also recommend the use of hickory for the middle joints. Mr. Stewart further advocates the "tie" rod in preference to that in ordinary use with brass ferrules. It is quite a matter of taste, however, and there is a disadvantage in the tied rod, in that it requires such an extraordinary waste of time to get ready. A 13ft. fly rod ought not to weigh much more than ¾lb., or it becomes exceedingly wearisome. Mr. Francis goes in for a double-handed rod always. *De gustibus*, etc. I can always manage a single handed rod better than a double.

The rings should be well made and somewhat large; there is a tendency to reduce the size of these as much as possible for the sake of appearance, but it is a mistake which should never be allowed. Each ring on the rod should allow of a threepenny piece being passed through it, and the decrease of size towards the top should be gradual, and not end in rings of less than half this size. They should be of solid brass, and of the form shown in the Tackle section at the end of this treatise.

The line for ordinary trout fishing should not be too fine, and, on the other hand, it is necessary for it not to be clumsy. The inexperienced

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beginner had better buy a hair and silk line, tapered. He will find it is usually supplied in from 15yd. to 30yd. lengths, and is cheap and exceedingly durable. The evils of a *fine* line to the novice are, first, an increased difficulty in getting it out, and next the great chance in the initial awkwardness of inexperience to snap it. However, the choice of line is not a main point, so long as it is composed of silk and hair, for the sake of lightness. Formerly *all* hair was used, but I consider the latter form the better, as it is more durable, and to some extent resists the accidental boot on it, which so aggravatingly and frequently cuts the line entirely of hair.

The reel is a matter involving considerable perplexity. Many old fishermen prefer the multiplying winch, but these I have good reason to detest. The size should not be large for, say, a 12ft. rod, and it should, when the line is upon it, give an agreeable sense of weight balanced to the hand. Properly it should act as a kind of "governor" of the force exerted in casting, and if selected with reference to this it becomes an acquisition of importance. The cleek or click winch is the sort I prefer, and is about 3in. in diameter, and in order to do away with that intolerable nuisance, the handle—on which one often finds the line wound when it should be running free—I have devised an arrangement which runs on the circumference, and is worked by the forefinger of the right hand. My objection to multipliers is due to their rapidly wearing out, as the bearings, cogs, &c., are of necessity of brass, and therefore easily worn down.

The casting line is always a most important part of the fly fisher's outfit. For trout fishing I prefer fine drawn gut in preference to hair, but for grayling, a white horsehair cast is *the* thing. The link or cast should be not less than within 6in. of the length of the rod, and should be composed of carefully selected quality, so that it may taper and be of round form, and quite even texture. I like its colour to be of a pale blue or slate, and in order to obtain this it is only necessary to add a little warm water to ink and soak the gut therein. In every case it is necessary to soak the gut link in water before using, and it is a good plan to carefully test its strength before attaching the flies and itself to the reel line. Many a good trout has been lost because of the omission of this simple precaution.

The selection of hook and the process of fly manufacture is treated fully in "Tackle Making," as well as the method of attaching and tying such knots as are necessary.

Having thus equipped my supposititious tyro, I must diverge slightly in order to consider in full the merits of the two great schools of fly fishing, of which Pennell is on one side the champion, and Francis,

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Blacker, Ronald, and a host of others the opposing forces. Before doing so, however, let me advert to the dress of the angler, a point I had almost omitted. Perhaps my directions cannot be better expressed in part than by the following stanza from the "Secrets of Angling," by "J. D., Esq.":

> And let your garments russet be or gray,
> Of colour darke, and hardest to descry,
> That with the raine or weather will away,
> And least offend the fearful fishes eye:
> For neither scarlet, nor rich cloth of ray,
> Nor colours dipt of fresh Assyrian dye,
> Nor tender silkes of purple, paule of gold,
> Will serve so well to keep off wet or cold.

It may be said in addition that the hat must not be white or light colour, but rather "russet or grey." Even a white "puggaree" is inadmissible.

The system of fly fishing with which Mr. Pennell astounded the conservative fly fishers of the day does away with the estimated one thousand patterns of artificial flies, and substitutes six arbitrary "typical" nondescripts in their place—viz., three for trout, grayling, &c., and three for salmon and grilse. His arguments are urged with such logical force that, if we accept his premises without question, we are bound to admit that the system is the only one by which the angler need be guided. Experiments with the flies he has constructed also *seem* to favour his theory. Before commenting further, however, a brief *résumé* of the arguments he uses is necessary. He commences by intimating that trout fly fishers now-a-days may be roughly divided into two parties—the "colourists," who think colour everything and despise considerations of "form," and the "formalists," who hold with Ronald that the natural fly actually on the water at a given time should be closely imitated, down to the minutest particulars of form and tinting. The latter class have probably never questioned what seemed to them a rational theory, and include the great majority; the former are but a section, though an increasing one, of the fly fishing community. Both these styles are held by our author to be unsound—in fact, the arguments of the two schools are, according to him, mutually destructive.

He estimates the position of the "formalists" as follows: "Trout take artificial flies only because they in some sort resemble the natural flies which they are in the habit of seeing; if this be not so, and if *colour* is the only point of importance, why does not the 'colourist' fish with a bunch of feathers tied on the hook promiscuously? Why adhere to the form of the natural fly at all? Evidently, because it is found, as a matter of fact, that such a bunch of feathers will not kill—in other words, *because the fish do not take the artificial for the natural insect.* If this be so, it follows that the more minutely the artificial imitates the

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natural fly the better it will kill, and also, by a legitimate deduction, that the imitation of the fly on the water at any given time is that which the fish will take best."

To this the "colourists" answer: "Your theory supposes that trout can detect the nicest shades of distinction between the species of flies which in a summer afternoon may be numbered actually by hundreds, thus crediting them with an amount of entomological knowledge which even a professed naturalist, to say nothing of the angler himself, very rarely possesses, whilst at the same time you draw your flies up and across stream in a way in which no natural insect is ever seen, not only adding to the impossibility of discriminating between different species, but often rendering it difficult for the fish even to identify the flies as flies. The only thing a fish can distinguish under these circumstances, besides the size of a fly, is its colour. We therefore regard form as a matter of comparative indifference and colour as all important."

Respecting these statements, which so reasonably seem to submit the case of both schools, Mr. Pennell points out that though they are logically complete answers to each other, nevertheless they err because they are based on insufficient distinction between that which is true and that which is false. It is clear, as the "formalist" says, that colour is not everything in a fly, because, if it were, a bunch of feathers tied on simply would take fish, whereas such is indubitably not the case. On the other hand, the "colourist" argument that, from *the way the artificial fly is presented to the fish, it is impossible* they can distinguish minutiæ of the form and imitation, equally commends itself to common sense and experience. "This," says Pennell, "is the point in fact in which the entomological theory entirely breaks down." The formalist omits to note the fact that the imitation fly is presented under entirely different circumstances from the natural fly, viz., under water instead of on the surface—wet instead of dry, and in brisk motion instead of passively floating. Thus the simulation of life instead of death, and because the ordinary material of which flies are made is too "fluffy" to retain its strength of colour when wetted, fly bodies are constantly made of hard silk instead of dubbings, and an unnatural quantity of hackles is added to it.

"The colourists," Mr. Pennell says, "take advantage of this undeniable position to assail the whole system of form as a blunder, and, in doing so, themselves make a blunder still greater; they not only draw from correct premises an erroneous conclusion, but they draw a conclusion the very opposite of the logical one. For if it be admitted (*a*) that trout do take the artificial for the natural fly, and (*b*) that from the way in which the fly must be presented to them it is difficult to be recognised, the logical deduction is not that the form is of no consequence,

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but, on the contrary, that it is of the utmost consequence, and that the fly should be as fly-like and characteristic as possible, so that, notwithstanding its rapid and unnatural movements, it may *at once and unmistakably be identified as a fly*. I do not see any escape from this position, which, if accepted, puts the colourists entirely out of court, as, by the previous arguments, are the formalists."

I have thus intentionally largely quoted Mr. Pennell for two reasons. The first is, that it is almost impossible to epitomise or condense his severely practical explanation, and the other is, that when I come to criticise his views I may not be accused of garbling his own plain unvarnished tale. For similar reasons I add his summary of the case given by him, and, as it is of much importance in my exposition, I trust the reader will read it with attention. These are his words, from "The Modern Practical Angler":

"To sum up the foregoing arguments, therefore, the true *rationale* of the matter seems to me to be as follows:

"1. Whatever salmon *et hoc genus* may do, trout certainly take the artificial for the natural fly.

"2. But, as the artificial fly is necessarily presented in an abnormal condition—namely, wet instead of dry, sunk instead of floating; and as the resemblance which wet feathers and silk under water bear to dry insect down, fluff, and wings on the water, is imperfect; (3) it is necessary, for the purpose of hiding the counterfeit, and partly also to hide the hook, to give the fly an unnatural life-like movement in the water, adding to it, also, an unnatural quantity of legs (hackles), which open and shut, and move with the movements of the fly.

"4. These 'movements' and alterations, however, make it impossible for trout to discriminate minutely between the various unnatural imitations of natural flies, whether in form or tint; (5) and render it doubly important that the imitation insect should be as characteristic and fly-like" as possible in shape, lest the fish should fail to perceive the resemblance altogether.

"6. *General shape, general colour, and size* are all that can be distinguished by the fish. These are the points, therefore, to be kept in view in the construction of artificial trout flies."

I think it will be admitted that these are fair deductions from the positions taken up by the writer, and I think they are the correct and unimpeachably true lines upon which the angler should proceed.

Again, I quote Mr. Pennell on his theory and its practice:

"It would be better, on every ground, to select two or three of the most favourite and distinctive families of flies, and imitate them only, not in their varieties or even species, but, as it were, in their types, and

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using those colours only which represent the prevailing tints in the selected families. What, then, are the most favourite families of flies—most favourite, that is, in the eyes of the trout? Without question, the *ephemeridæ* and *phryganidæ*, and for a very good reason, as, with hardly an exception, they are all bred in the beds, banks, and reeds of the waters over which they afterwards fly. To the first-named family belong, roughly speaking, the whole collection of the 'duns' and 'spinners,' the drakes or May flies, the dark mackerel, the sand fly, and the March brown; whilst the latter includes the cinnamon, the grannom, or green fly, the willow fly, and—more important than any—the stone fly, or 'water cricket,' which, in the early part of the year, is so plentiful on many rivers. . . . . .

"As regards form or shape no question can arise, as the selected families are all unmistakably and characteristically *flies* in the proper sense of the term, having wings, legs, and, I think, without an exception, 'whisks,' or hair-like appendages at the tail. These whisks are not only very 'fly-like' and distinctive features, but are also easily imitated, and assist materially to disguise the hook, *as well as to make the fly swim straight*. This last is an important point, as the effect of the extra weight at the bend of the hook, unless counteracted by some additional 'float,' is to make the fly swim tail downwards. The great majority of the most favourite river flies belong to the order *Neuroptera*, or nerve-winged insects, the wings of which, being filmy and transparent, cannot be really imitated by feathers, or by any other available material. Wings are, therefore, merely an encumbrance to the artificial trout fly, and should be entirely rejected.

"The next point is colour. On examining the fresh caught *ephemeridæ*, or *phryganidæ* (for those in entomologists' collections are generally faded), it will be found, in the first place, that there is almost always a general similarity in colour, though not in the exact tint, between the wings, the bodies, and legs, and that the colours which predominate—indeed, almost monopolise—are greens, yellows, and browns. Our typical flies should evidently, therefore, be of these colours.

"Moreover, the colours of the bodies of the ordinarily imitated flies made of silk dubbing, &c., generally change when wet, and thus lose another important item of the exact imitation, whilst, as a rule, they always lack the glossy, semi-transparent appearance of the real insects. . . . . .

"Size, a most important point in artificial flies, demands the next consideration. As we have no longer imitations of individual species, size is a matter of no moment as regards the flies themselves, though of the utmost consequence in another point of view. And this is one of the greatest advantages which those who may act on the principles here

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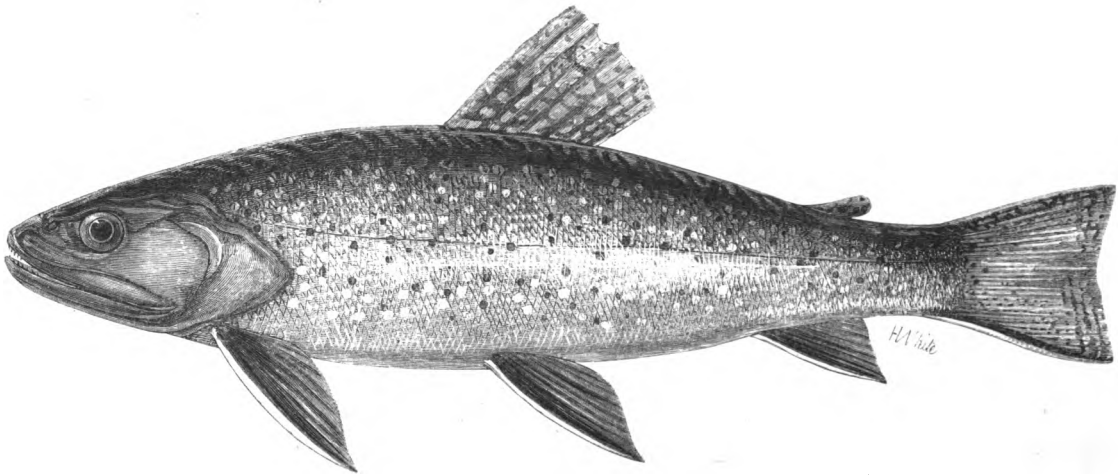

THE AMERICAN BROOK TROUT—(*Salmo fontinalis*).

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advocated will reap. For nothing is more certain than that some waters —usually large ones, whether rivers or lakes—require large flies ; whilst small ones, almost equally universally, have to be fished with small flies. . . . . .

"Under my system, in which the flies are typical and not specific imitations, the size can always be adapted to the size of the water, without any loss of imitativeness."

Now, Mr. Stewart, notwithstanding Pennell's assertion that he has adopted the position which Ronald took, which insists on the imitation of the natural fly, gives a sort of diluted Ronald, with a dash of Pennell opinion in the choice of flies. He says—"In practice it has been proved, beyond a doubt, that a black, brown, red, and dun coloured fly used together, and varied in size according to circumstances, will at any time kill as well and even better than the most elaborate collection arranged for every month in the year. . . . . If he has four flies, such as those mentioned above, he cannot be very far off the mark, as these comprise all the leading colours of which insects generally are." He also condemns the many flies in vogue amongst fishermen, and adds, as to the preference given by trout for different colours, "Their caprice, however, and love of variety may be the main reasons why trout prefer one colour to another." From these extracts it will be seen, therefore, that he is adverse to the pursued imitation of all the flies given by Francis and Ronald.

Let us now glance at the opinion Ronald really did espouse in reference to the subject, that the whole of the question may be fairly before the reader ere he is called upon to use his judgment as to the best system. "It should never be forgotten that, let the state of the weather or the water in respect of clearness be what it may, success in fly fishing very much depends upon showing the fish a good imitation both of colour and size, and of that insect which he has recently taken—an exact resemblance of the shape does not seem to be quite so essential a requisite as that of colour, since the former varies according to the position of the insect either in or on the water—but a small fly is usually employed when the weather is fine, because the fish is then better enabled to detect an imitation, and because the small fly is more easily imitated. The resemblance of each particular colour is not required to be so exact as in the case of a large fly."

I have thus given, perhaps somewhat tediously, the opinions of the three great masters of fly fishing, for the direct purpose of placing before the reader the systems on which they base their faith and practice. It now becomes my duty to criticise the views of Mr. Pennell in the light of my own experience, and I think I shall have little difficulty in showing the weakness of his propositions.

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First let me say that I agree word for word with his summing up of the *rationale* of fly fishing, but that I totally disagree with his reduction of it to practice. He begins: "If, when presented to them in the only manner in which we can present them, nice variations of imitations and shades of shape and colour cannot be distinguished by trout, the great mass of flies now used are obviously unnecessary, and, where either the colour or the outline is confused, are mischievous. It would be better on every ground to select two or three of the most favourite and distinctive families of flies, and imitate them, only not in their varieties or even species, but, as it were, in their types, and using those colours only which represent the prevailing tints in the selected families."

Now, in reference to the above, why, even bad imitations are mischievous. Supposing that trout *are* unable to appreciate such niceties, which, by the by, do not in the great mass exist, the mischievousness is not apparent; and why counsel the making of imitations of only one or two "types," so called? Surely, because the trout cannot tell a golden dun midge from a yellow dun, Mr. Pennell is not justified in substituting a wholly brown or yellow shapeless assemblage of hackle. Admitting that a general imitation of the *ephemeridæ* (May flies) would serve—not a manufacture of type, *i.e.*, all green, all brown, and all yellow—there is no necessity, even from the acknowledged fact that fish cannot discern niceties of shade and shape, to offer them a wingless abortion of green.

Such a deduction from the "summing up" to which I above refer seems to me to be far from logical. I am ready to grant there is a waste of time and ingenuity in the imitation of each variety and species of fly, as will be seen from what I shall say anon, but that many totally different insects can be represented to a trout of the nineteenth century by three homogenous colours and flies I conceive to be an absurdity of a most egregious character. Mr. Pennell goes on to give a list of these flies, which are unmistakably the favourites of his quarry, and this list is correct. The outcome of this enumeration is the conclusion that it is only the *phryganidæ* and *ephemeridæ* which ought to be unrepresented—no, I beg pardon, he is not so rational—"from which our typical flies should be made."

Having further stated that these insects are unmistakably flies with wings, he goes on to construct a typical fly "without wings." Having determined the tint of the mass of these families, he passes it through the spectrum of his own imagination, and decomposes it into three constituents, "green," "brown," and "yellow," and the outcome is a type possessing about two hundred legs and either of these colours.

Now, let us endeavour to realise the position of a trout. Ephemeral in-

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sect life, which possesses certain characteristics broadly separating it from minnows, *et hoc genus omne*, or, in other words, a fly, possesses certain features which plainly indicate to the fish that it is a fly, and not a worm or a minnow. These, broadly, are wings and legs, and a slight body, of a shape scarcely ever varied in general outline. Certain insects are more nutritious than others, possessing, like the ant, may be, a juice of vital fluid, which has for the stomach of a trout peculiar attractions. These properties fix its general shape and form, and impress its identity on the fish's eye, and he, having once taken such an insect, does not forget it. Its colour is probably not very distinctly seen from underneath, but we are not warranted in supposing that the point is of no consequence. Indubitably, trout are occasionally colour blind, for on some streams they will only take flies of a peculiar colour. Usually, however, any fly which most clearly imitates the general characteristics of the natural fly will kill fish. Ergo, a close imitation of the features of the prevalent fly at the time of fishing is the right and only method. I am quite prepared to admit that there is exceeding difficulty in imitating the nerve-winged insects which chiefly form the food of trout, but that cannot be a reason for not attempting to do so. As a green drake lies upon the stream it simply exhibits its delicate tracery of wing-fibre, and not the transparent interspacing. It is admitted that fish cannot clearly distinguish the difference between this tracery and its varieties; why should one, therefore, be so very careful that the imitation is exact, though it is probably better so, because the limit of the trout's perceptive power is not known? I ask any unprejudiced person to turn to the dressings given by Ronald and compare the imitation with the original, and say if the impossibility is so great as Mr. Pennell would make out.

The "green," "yellow," and "brown" almost monopolise the *phryganidæ* and *ephemeridæ*, *therefore* Mr. Pennell would fish with a bait confessedly not an imitation of the *shape even* of any fly, and either all green, all yellow, or all brown. And this is the system of fly fishing which, to use his own words, has "never been fairly met or logically controverted." How can anyone meet or "logically controvert" that which has no logical sequence?

But our author asserts that his theory and practice stand the test of experience, and is, indeed, victorious over all others. Apart from the crushing reply to this, which emanated from the late Mr. Stewart, and is published in a brochure form by Black, of Edinburgh, I would refer to an experience of another sort, which the angler will no doubt apply when the American kill-devil—which consisted of a spoon, silver on one side and red on the other, and ornamented with a tuft of red worsted—came over for

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pike. I tried it in a lake of limited dimensions, and the result was wonderful. It even beat the natural bait, no matter how presented. After a time, though plenty of fish still remained—for many, the majority, in fact, which were caught were returned—it lost its attractiveness. Gradually it became less killing as the eyes of the fish became used to the novelty, and now the result with it is *nil*. Why? may be asked.

This is the true reason. All creatures of prey are strangely affected by glitter and glow and colour until their vitality and movement cease to stimulate. The philosophy of the reason for this need not be here discussed. The fact remains. "Valuing the giddy pleasure of the eyes," they seek its possession, or to know what it is; possibly its "life," "glitter," "movement," "warmth," call it what you like, rouses an antagonistic spirit common to predaceous creatures. Anyhow, such baits kill for a time, and that only.

Thus is it with Mr. Pennell's flies. I have tried a stream accessible to myself only with these flies so persistently that now I cannot get a rise at them. The curiosity of the flesh is satisfied; the stimulus which the bright fast colours hitherto occasioned has lost its power. But they will take a May fly imitation, because it looks like a fly of which they are profoundly fond.

Now, as to size. It is indisputable that some men require a small fly, as Mr. Pennell properly observes, and it is equally true that the small fly may not be half the size of the normal growth of the insect. But has Mr. Pennell observed the fact that, on the rivers requiring small flies that insect life is generally not very plentiful, from some natural cause and that the insects are themselves not of normal size in the majority of cases? Owing to climatic necessities, the Esquimaux are abnormally small people, but they belong to the *genus homo* nevertheless. Owing to some peculiarity of *habitat*, the *ephemeridæ* on some streams are dwarfed and not numerous, but they are flies notwithstanding. How often, it might be asked, is it necessary to use a *larger* fly than the natural one on a given stream? Depend upon it, the sitting down and imitating extemporaneously the fly you have driven out of the scope, as Ronald recommends, is of a sounder theory and practice than the "typical" fly can boast. The latter are evolutions from Mr. Pennell's inner consciousness, and, his subtleties in their favour notwithstanding, had better there remain, so far as the tyro is concerned, if he desires to become a first-class fly fisher who can, no matter how long he fishes a stream, procure himself fair sport so long as fish therein remain.

That the reader may not, however, accuse me of withholding information, I give Mr. Pennell's dressing of his three typical flies for trout and grayling:

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The Green. — Hackle, *dark* green; body, darkish green sewing silk lightly waxed with colourless wax; whisk cut end of hackle.

The Brown.—Hackle, fiery or cinnamon brown, not claret brown; body, dark orange sewing silk well waxed with cobbler's wax, and then drawn tightly between the finger and thumb; whisk cut end of hackle.

The Yellow.—Hackle, dark golden olive; body, golden yellow sewing silk lightly waxed with colourless wax; whisk cut end of hackle.

The remarks here made do not refer in their entirety to salmon, as will be seen in the chapter on that fish; but they do for grayling *in toto*. The only suspicion of justification for this arbitrary use of certain colours is to be found in "Blacker's Art of Angling." I quote the passage, because of its excellent precept: "I have always found the natural flies, of every size, to have a tinge of green throughout the year; and the greyish colour of the flies in the spring months is precisely the same in the latter end of the season. The angler should examine the natural flies at all times when he is on the stream, and if he perceive that they have a tinge of green, he should mix a little with his standard colours, or if the body of the fly is made of floss silk, he should place the green at the shoulder, underneath the hackle, and judge of the shade of green he should use by the appearance of the natural fly."

As I have fully indicated in the foregoing, I adhere to the Ronaldian theory and practice in fly fishing, and, therefore, would imitate, as far as might be, the flies upon the water, or in its neighbourhood, at alltimes, in preference to using the so-called typical nondescripts created by Mr. Pennell. Even Stewart's adherence to a few colours in the half-hearted paragraph before quoted—compromise though it may be between the "typical" theory and that of Ronald's—to my mind shows a narrow and unphilosophical judgment on the part of a great angler. The fact is, any fly will kill if sufficiently gaudy, but why? As I have before pointed out, it is because of its novelty and attractive freshness. Curiosity, lust of the eyes—as Bunyan calls love of finery—any such notion may possess a trout for aught I know. The salmon is a great and convincing example of this curious desire on the part of fish. Mr. Pennell's flies act alike upon salmon and trout; they excite the inquisitiveness, hence they in a measure are successful. Salmon, satiated with a plethora of good feeding, like an old Roman gourmand, longs for any novelty to "tickle the brute force within the"—fish into action. A novelty tantalises it and it dashes forward, and lo! a hook holds it. It is thus with the trout; but is this legitimate fishing? and is it not possible to take undue advantage of constitutional weakness as well of a fish as a man?

The imitation of many flies cannot be mischievous, and is sure to be regulated by the means and experience of the imitator or angler. If the

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angler cares to render his fishing book as complete as possible, he must spend much time and trouble and money in so doing. Not only this, he also must tax his utmost ingenuity in the selection of materials, and as a guerdon for such pleasurable exercise of, perhaps, the most satisfactory of all man's faculties, he finds himself a better and a more successful angler. Suppose it were possible to imitate a fly—and I do not doubt but it is—as closely as the Tussauds imitate criminals, or a good copyist painter imitates a Raphael, a Titian, or Velasquez, can Mr. Pennell contend that his typical flies would in such case be superior? To do so would be absurd.

As it is, the young angler or the novice at fly fishing, for both of whom I am now specially writing, need not burden themselves with the numberless varieties which delight the sexagenarian fisherman, but simply make up his flybook with flies of the greatest prominence. I shall give a list of these, and indicate their value—that is, approximate value, for no one in the world can surely determine the value of any lure, else were fishing robbed of half its charm. I do not insist on a long list in the education of the tyro, but I do most earnestly wish to impress on the mind of the young fly fisher the necessity of *learning* his list and how to make its members. This becomes the easier if such a beginner be a bit of an entomologist, and to assist such an one I have not failed to give the scientific names of most of the insects to be imitated, that their identity may be recognised, and, if the user chooses, their natural history be learned.

Before going any further, perhaps a *précis* of what it is very desirable for the angler-naturalist to know, viz., insect history, may be desirable. Especially is the natural history of the *ephemeridæ* curious and phenomenal. I purpose, however, not to extend my remarks on the various flies and their different stages of existence to a length beyond that really desirable for angling purposes. The fisherman who is able to intelligently imitate his fly, and not only imitate but select with judgment the fly which is most plentiful, or seems to be the particular favourite of the fish of the locality in that season, must possess an advantage as compared with the ignorant fly fisher hardly capable of over-estimation. I cannot sufficiently urge on all who intend making themselves really accomplished anglers, to combine as far as possible with their actual fishy lore a knowledge, at least elementary, of the various natural surroundings of their occupation. Such knowledge is more than good—it is inestimable. The flies employed by the angler are chiefly born of the water. The most generally used are comprised under two orders—the *Neuroptera*, or nerve-winged (with veined wings like the drakes) and the *Trichoptera*, or hairy-winged (like the sandfly, cinnamon, silver horns, &c.); but

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considering that there are nearly 200 species of these, it is evident that the selection of suitable flies which I have made in the succeeding pages does not comprise more than a small integral quantity. These two orders are subdivided: the *Neuroptera* into the *ephemeridæ* (May flies, &c.) and *perlidæ* (as stone and willow flies), and the *scalidæ;* the *Trichoptera*, so far as our waters are concerned, into the *phryganidæ* only, that is, if the "silver horns" be excepted.

Apart from these two orders, the other flies most used belong to the coleopterous or beetle (sheath winged) kind (of such are the Marlow buzz, the fern fly, and the peacock), and the diptera, or two winged (as the cowdung, black gnat, gravel bed, &c.). The most of these are, however, land insects.

The two families, however, on which the hopes of the angler mainly rest are the *ephemeridæ* and the *phryganidæ*. Of these I shall first refer to the *ephemeridæ*, and as the May fly (*Ephemera vulgata*) presents all the characteristics in fullest fruition of the family, to this beautiful insect will I specially point.

The May fly presents items of life history of a more novel character than most of its compeers. The butterfly's life, briefly, is as follows: First, it is an egg; this, when hatched into life, becomes a caterpillar or larva, from the Latin, meaning a mask. In this larva state it continues some time, until the period for the third change approaches. It then seeks an obscure corner, and a kind of hard skin spreads over its body and incloses it as in swathing clothes. Hence *pupa*, from the Latin, signifying infant. Some of these *pupæ*, from being of a golden colour, have been termed chrysalids, from a Greek word having a similar meaning. After remaining in pupa state for a greater or lesser time, according to species, it emerges in all its mature beauty, and this last stage is that termed the *imago*. These are the embryonic developments of an ordinary lepidopterous insect, and a more admirable and interesting series of changes cannot be imagined.

The *Ephemera vulgata* goes through a series of changes like these enumerated, with the addition of a fourth, termed pseud-imago, or false image, immediately preceding its complete maturity. To trace the *ephemeræ ab ovo*, the eggs are dropped in the water in immense numbers, and are devoured by the crustacea and other foes in huge quantities, but a sufficiency remain to become larvæ, and they in turn wage ceaseless and devouring war upon fish eggs, maintaining the grand and unvarying balance of life which obtains all over the multiform creation. The larvæ, being aquatic insects, are endowed with gill-like appendages extending down each side of the abdomen; these are continually in motion, and the air is separated from the water and conveyed to the tracheæ. The

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larvæ are also endowed with legs, with which they swim or walk. The pupa is not much different from the larva, except in the fact that the wings may be perceived folded up and encasing the throat. Both the larva and pupa form holes in the bottom and sides of the stream, and creep under stones to escape the attention of their piscine enemies. I believe that they remain in this state in some cases as long as two or three years. When the time for transformation arrives the pupa rises to the surface and becomes the green drake—its pseud-imago state—and manages to settle on the stem of a rush or bough overhanging the water. After a few seconds of sunshine, however, the thin pellicle which has inclosed it splits up the centre, and the imago appears.

The green drake, or pseud-imago, is often taken by fishermen for the male, and the imago, or grey drake, for the female insect; but, as I have explained, this idea really has no foundation in truth. The green drake is a beautiful creature, and its wings are fringed with a light down or hair, which is one great distinguishing mark of its immaturity; the caudal filaments are also shorter. All the "duns" are of the *ephemera*, and belong to the pseud-imago state, and the spinners—so called—are of the imago condition. This is an important fact to be borne in mind. Sometimes the *ephemeræ* start into existence in countless myriads, and the air is black with their number. I have been before now literally covered with the cast of the pseud-imago garments of an assembling multitude of these creatures.

I may add that I have kept the larva for two years myself in a small aquarium, and I found it was as voracious as any other aquatic insect whatsoever, and even cannibalistic.

The *phryganidæ* forms a strange and beautiful section of animate creation, and its history is specially fascinating in a study where every creature shows wonder on wonder accumulated. The full-grown female usually deposits her ova on the leaf of a tree—be it alder, willow, or oak, it little matters—overhanging the water. Here they remain till hatched, sustained during the period by a sort of natural gluten which fastens them securely. When hatched, they are queer six-legged creatures, which drop instantly off into the water and sink. With unerring skill they then commence to gather round them, using a natural secretion, pieces of stick, plants, pebbles, shells, often containing living inmates. A kind of coil is thus obtained, the gluten assuming the form of a kind of silk web, in which the shells, &c., are embedded. The larva is thus secure from fishy enemies, or comparatively so, and seeks its food roaming about with slow but restless activity. There are many interesting points about the buildings of these subaqueous engineers, which I wish I had space to mention here, but, as I have not, I may refer the reader

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to the appendix to Mr. Francis Francis' "Fish Culture" (Routledge), in which he describes the experiments of a lady with these larvæ and coloured beads, and to the chapter on "The Etymology of Bait" in "Fishing Gossip" (A. and C. Black, Edinburgh). Indeed, I recommend a careful study of these creatures to the young angler as being likely to form a subject of great usefulness in his education.

When the time has come for the caddis or larva to assume the pupa state, it anchors itself to the bottom, and closes up the mouth of the case with a strong network of silk, through which it breathes. After passing a certain time in this state the pupa cuts its way through, leaves its case, throws off its filmy covering, and becomes a fly.

Of the black alder fly, the larva of which is the common caddis of the Thames, the late Canon Kingsley pronounced the following eloquent rhapsody :

"O thou beloved member of the brute creation! songs have been written in praise of thee, statues would ere now have been erected to thee, had that hunchback and flabby wings of thine been 'susceptible of artistic treatment.' But ugly thou art in the eyes of the uninitiated vulgar; a little stumpy old maid, toddling about the world in a black bonnet and a brown cloak, laughed at by naughty boys, but doing good wherever thou comest, and leaving sweet memories behind thee, so sweet that the trout will rise at the ghost or sham of thee, for pure love of thy past kindnesses to them months after thou hast departed from this sublunary sphere. What hours of bliss do I not owe to thee! How have I seen in the rich meads of Wey, after picking out wretched quarter-pounders all the morning on March brown and wretched hackle, the great trout rush from every hover to welcome thy first appearance among the sedges and buttercups! How often, late on in August, on Thames, on Test, on Loddenheads, have I seen the three and four pound fish prefer thy dead image to any live reality! Have I not seen poor old Si Wilder, king of Thames fishermen (now gone home to his rest), shaking his huge sides with delight over thy mighty deeds, as his 14in. whiskers fluttered in the breeze like the horse-tailed standard of some great bashaw, while crystal Thames murmured over the white flints on Monkey Island shallow, and the soft breeze sighed in the colossal poplar spires, and the great trout rose and rose and would not cease at thee, my alder fly? Have I not seen, after a day on which the earth below was iron and the heavens above as brass, as the three-pounders would have thee, and thee alone, in the purple August dust, old Moody's red face grow redder with excitement, half proud at having advised me to 'put on' thee, half fearful lest we should catch all my lady's pet trout in one evening? Beloved alder fly! would that I could give thee a soul

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(if, indeed, thou hast not one already, thou and all things which live) and make thee happy in all æons to come, but as it is, such immortality as I can bestow on thee here is small return for all the pleasant days thou hast bestowed on me."

There are several variations in the methods of emergence, but practically, whether a shorter or longer time be taken, the procedure is the same. In the case of the stone fly, for example, after leaving its case, it creeps to the shore and there passes several days before it becomes a fly proper. In this state it is the creeper of northern anglers, of fishing with which I shall have something to say anon.

Concerning the personal appearance of the creeper, Stewart says that it is the most "venomous-looking insect that the angler in pursuit of his vocation has to encounter." And so it is. It runs fast, with a wriggling serpentine motion, and when taken up in the hands for the first time its six forked legs tickle one as alarmingly as does a cockchafer. It is very deadly to fish, however.

Having thus adverted to the natural history of the chief families of flies with which the tyro has to deal, I will without further preface give a list which, whilst not being very long, is very sufficient. Also, as a curiosity, the reader will perceive I have quoted the flies given by the earliest English writer on the subject, Julyana Berners, in the Boke of St. Albans. The angler will note the advancement of his art from this. The list is arranged according to season, but this arrangement must be varied as experience and locality dictate. It may be added that in most cases it is not advisable to commence fishing till March. Therefore I begin with

Flies for March.

"*The Donne Flye.*—The body of the donne woll and the wynges of the pertryche. A nother donne flye, the body of black woll, the wynges of the blackyst drake, and the jay and the wynge and under the tayle." Dame Berners gives this as a good fly for March, which, albeit very inferior to those of modern make, will kill satisfactorily. Mind, I do not recommend it, but as a curiosity I have made and used it with singular success, when the trout seemed unwilling to notice the finer manufactures of Ronald and Francis.

The Red Fly, or Old Joan (Order *Neuroptera*, family *Perlidæ*, genus *Nemoura*, species *Nebulosa*).—This fly is often out as early as the middle of February, and is in certain parts of England very plentiful. At Bakewell, according to Ronald, it is especially so. The following is that author's dressing of the fly, which I here, in every case, give for the reason that I can conceive of no better method or materials in the majority of cases. The fly is called the February red in some parts and

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remains a killing lure till the end of that month. Its colours are indicated by the dressings:—"*Body*.—The dubbing is composed of the dark red part of squirrel's fur, mixed with an equal quantity of claret-coloured mohair, showing the most claret colour at the tail of the fly. This is spun on brown silk thread, to form the body. *Wings*.—From the softest quill feather of the peahen's wing, which approaches the tint. *Legs*.—Of a claret-coloured *stained* hackle. No feather of its *natural* colour, that I know of, is of the proper shade. Clip some of the upper fibres off, that the wings may be flat. Hook No. 2, short." The following is the dressing given by Mr. Francis, received by him from the president of the Leintwardine Club, in whose hands it was very successful: "*Body*.—Two turns of dirty claret red mohair at the tail, and medium brown mohair with a strand or two of hare's ear and claret thrown in for the rest of the body. *Hackle and Legs*.—A dark grizzled blue dun (cock's) wing, a slip from the back of a peahen. Hook No. 9 or 10."

The Blue Dun or Cock Tail (Order *Neuroptera*, family *Ephemeridæ*, genus *Potamanthus*, species *Rufescens* [pseud-imago]).—This fly is but a phase of the Red Spinner, given in another part. It is fairly plentiful in the beginning of March if the weather be mild, and becomes more so towards the middle of the month. It is found on the water on windy days when the wind blows from cold quarters, and I have seen it positively numerous when a sharp nor'-easter has brought us sleet. It rapidly takes flight after relinquishing its pupa state, and unless the weather be mild, it does not assume much vigour of flight, becoming then an easy prey. The fly is also known as the Early Dark Dun, the Hare's Ear, the Blue Bloa, the Olive Bloa, the Blue Drake, the Hare's Pluck, the Hare's Fleck, and the Blue Upright. It is a general favourite. *Body*.—Fur of a hare's ear or face, spun very thinly in fine yellow silk, and wound on thickest at the *shoulder*. Some of the dubbing is then picked out to form legs. *Tail*.—Two fibres of a dun hackle. *Wings*.—From a quill feather of the starling's wing, which may be slightly stained in onion dye. *Legs*.—If a sufficient quantity of dubbing cannot be pricked out for the legs, two or three turns of a ginger dun hackle can be added, and will help to keep the wings upright. Put these on last, whipping them on the *bare hook*, and finish the head. (Ronald.) According to Francis, "Ephemera," in his list of March flies, reproduces this fly under four different names, viz., the early Dark Dun, the Olive Fly, the Dark Hare's Ear, and the Yellow. Certainly it is at any rate a Proteus-like fly, albeit a valuable one. "A rose by any other name would smell as sweet," &c. Francis gives Ronald's dressing.

The Red Spinner (Order *Neuroptera*, family *Ephemeridæ*, genus *Pota-*

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manthus, species *Rufescens* [imago]), which is the same insect as the Blue Dun in a different stage of existence, is dressed thus by Mr. Francis. As each writer gives a variation, I select his, it being unquestionably the best: "*Body*.—Dark red brown silk, winged with fine gold wire. *Legs*.—A red hackle. *Tail*.—Three wisps of the same. *Wing*.—A dark, shiny, brown feather, the more brilliant and transparent the better." (By the by, Mr. Francis' brilliance is chiefly given by opacity!) Ronald: "*Body*.—Thin, of bright brown silk, ribbed with fine gold twist. *Tail*.—Two whisks of a red cock's hackle. *Wings*.—Upright, from a mottled grey feather of the mallard, stained to match the colour of the natural wings. *Legs*.—Plain red cock's hackle."

March Brown Dun Drake, called in Wales the Cob Fly (Order *Neuroptera*, family *Ephemeridæ*).—It requires much higher temperature and a comparative absence of wind to enable the *nymphæ* of this fly to change to its imago state. It lives three days or thereabouts, and then changes into the great Red Spinner. There is a slight difference between the male and the female of these flies. The former is of a chocolate hue, and the latter of a green brown. It continues in season till May, and I have even used it on some waters with considerable success till August. It is not then, however, to be found in any numbers. The following is a capital imitation of the male. *Body*.—Five of the hare's face, ribbed over with olive silk and tied with brown. *Tail*.—Two strands of a partridge feather. *Wings*.—Quill feather from the middle of the hen pheasant's wing, which may be found of the exact shade. *Legs*.—A brown mottled feather from the back of a partridge.

Cow-dung Fly (Order *Diptera*, family *Muscidæ*, genus *Scatophaga*, species *Stercoraria*).—This well-known fly is plentiful during all the warm weather, and forms a most useful lure; on some streams great quantities can be seen in March. The early specimens are mostly small, but as April comes in and progresses they become larger and more lively. The following is a capital dressing. *Body*.—Yellow worsted, crewel, mohair, or camlet, mixed with a little dingy brown fur from the bear or squirrel, and left rough, spun upon light brown silk. *Wings* from the landrail. *Legs*.—Of a ginger-coloured hackle. The female is made buzz thus: *Body*.—Olive-colcured mohair or worsted, spun on silk of the same colour. *Wings and Legs*.—Of a red cock's hackle, changed to a brown colour by putting it into a solution of copperas. Hook No. 3, short.

The Red Palmer.—Though Mr. Francis scorns the necessity for the close imitation of the caterpillar of the *Arctia caxa* moth, there can be no doubt that this caterpillar is killing, whether it is seldom or often found on the water. According to Currie, it changes its skin ten times

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during its existence, only, however, slightly altering the colours. Peacock herl, with a red cock's hackle wrapped over it, and tied with light brown or red silk thread. This corresponds also with the larvæ of the Drinker Moth (*Odnestis potatoria*). It may be varied by a *ruby stained* hackle, which answers well on the Dove. Hook No. 6 (Palmer's).

The Brown Palmer.—Caterpillar of *Spilosoma lubricapeda*, or the spotted Buff Ermine Moth, found on nettles. Mulberry-coloured worsted, spun on brown silk, and a brown-stained cock's hackle wrapped over the whole. It may be varied (to imitate *S. Menthastri*) by making the body of ostrich herl, of a drab colour, and winding a grizzled hackle over. Hook No. 6 (Palmer's).

The Black and Red Palmer.—This is the caterpillar of the *Cutia cæca* moth, full grown. Black ostrich herl ribbed with gold twist, and a red cock's hackle wrapped over it. This fly may be made *large*. The feather at the shoulder should be a large furnace hackle from the *rump* of a game cock, and the ostrich should be wound *thickest* there. The gold twist should be shown clearly at the tail, and the tail hook should be large and strong. These hackles are useful all the year round, and that is one reason why I have placed them in the list so early. They are also capital lures for Thames trout if dressed large, and I have killed more than one good chub with this fly. In fishing for the latter fish I never use more than a stretcher, finding that if a couple of these fish attack one there is but scant chance of restraining, and a great risk of losing, both.

Flies for April.

"*The Stone Flye.*—The body of black wull, and yelowe under the wynge. and under the tayle and the wynge of the drake. In the begynnyng of May a good flye. the body or roddyd wull and lappid abowte wyth black sylke: the wynges of the drake and of the redde capon's hakyll." (Book of St. Albans.)

Yellow Dun or Dotterel Dun (Order *Neuroptera*, family *Ephemeridæ*, genus *Baëtis*, species *Flavescens* [pseud-imago]).—This is a most fairy-like and altogether beautiful fly, and is generally on the water from ten till three. It seems to be a sort of second crop of the Blue Dun, and prefers warmer weather for its appearance. It should not be dressed larger than the Blue Dun. *Body.*—Yellow mohair, mixed with a little pale blue fur from a mouse, or yellow silk thread waxed, and with the least blue rabbit fur spun upon it, and ribbed with yellow silk. *Wings.*—Upright, from the lightest part of a young starling's quill feather. *Legs.*—A light yellow dun hackle.

Iron Blue Dun (Order *Neuroptera*, family *Ephemeridæ*, genus *Cloëon*, species *Diptera* [pseud-imago], Ronald).—This is the Iron Blue Drake of

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Theakstone, Little Iron Blue of Wade, Little Dark Blue of Jackson, Little Dark Dun of "Ephemera." It is one of the smallest flies used by the angler, but is not the less useful on that account. It is on the water chiefly on cold days, and is an exceedingly valuable little bait on occasions, especially in some rivers, for grayling. It changes to the Jenny Spinner after a few days. *Body.*—Blue fur from a mole; reddish brown floss silk may be tied on for the head. *Tail.*—A whisk or two out of a yellow dun hackle. *Wings.*—From a feather of the underside of a cormorant's wing; or, in default thereof, a feather from the breast of the water hen, the tip of which must be used; or the upper end of the wing feather of a tomtit when in full plumage. *Legs.*—A very small yellow dun hackle. The blue of this fly is very difficult to hit exactly. It is therefore well to have several shades of the hues required dyed by Judson's dyes, which, by the by, I have found very valuable in fly tying.

Jenny Spinner, or Spinning Jenny (Order *Neuroptera*, family *Ephemeridæ*, genus *Cloëon*, species *Diptera* [imago]).—This is the Blue Dun in its new dress, and lasts four or five days. It is the little White Spinner of Jackson and the Pearl Drake of Theakstone. *Body.*—White floss silk wound round the shank of the hook, &c., and tied on at the head and tail with brown silk, which must be shown. *Tail.*—A whisk or two of light dun hackle. *Wings and Legs*—Are best imitated by making them buzz, for which purpose the lightest dun hackle that can be procured should be used. Hook No. 0, short. The foregoing is probably the nearest of all to the natural fly, but is very imperfect nevertheless.

Black Gnat, or Black Midge (Order *Diptera*, family *Empidæ*, genus *Rhamphomyia*, species *Æthiops*).—This tiny fly, from its difficulty of imitation, has been called the "fisherman's curse" by Jesse and others. It is very killing. I have found the stomachs of trout and grayling nearly gorged with this little fellow, and I recollect full well getting seven brace of beautiful trout one April evening from the Wandle with its imitation (as follows), after toiling all day and catching nothing with other flies. *Body.*—Black ostrich herl. *Wings.*—The dark part of a feather from the starling. *Legs.*—A black hackle.

Hawthorn Fly (Order *Diptera*, family *Tipulidæ*, genus *Bibio*, species *Marci*).—This is a land fly, and is found plentifully towards the end of April, near and in hawthorn bushes or hedges. There are three sorts, but the middle size is that imitated. The female of each has dark opaque wings, whilst the males have theirs dark but transparent. The male is more abundant than the female. *Body.*—Black ostrich herl. *Wings.*—A feather of the starling's wing. *Legs.*—A black cock's hackle, or one or two of the two largest feathers from a peewit's top knot. Hook No 2 or 3, long.

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Gravel Bed, or Spider Fly, or Sand Gnat (Order *Diptera*, family *Tipulidæ*, genus *Anisomera*, species *Obscuræ*).—This fly is by no means a numerous species. It is found only in a few localities, but where it makes its home it is tolerably abundant. In cold days it takes shelter amongst the larger stones of the gravel, and in its use is applicable to any part of the day. It makes its *début* about the middle of April, and is in season for at least a month. *Body.*—Dark dun or lead coloured silk thread, dressed very fine. *Wings.*—From an under covert feather of the woodcock's wing. *Legs.*—A black cock's hackle, rather long, wound twice only round the body. Hook No. 0 or 1, long.

Sand Fly (Order *Trichoptera*, family *Phryganidæ*, genus *Limnephilus*, species *Flavus*).—This fly has been highly extolled by many fly fishers, not the least by Bainbridge. In the "Flyfishers' Guide" he says that "it may be reckoned as one of the best flies for affording diversion which can possibly be selected, for it may be used successfully at all hours of the day from April to the end of September, and is equally alluring to trout and grayling." The fly called the cinnamon fly, used in September, very nearly resembles it. Mr. Francis does not seem to think much of it. I do. It has resulted in some really considerable sport on suitable occasions to me, and I here can safely recommend it as one of the most useful of the "all round" flies—a term which will explain itself. *Body.*—Of the sandy coloured fur from the hare's neck, spun on silk of the same colour. *Wings.*—From the landrail's wing, made full. *Legs.*—From a light ginger feather from the neck of a hen.

Flies for May.

"*The yelow flye.*—The body of yelow wull: the wynges of the redde cocke hakyll and of the drake lytted yelow. The blacke louper, the body of blacke wull and lappyd abowte wyth the herle of ye pecok tayle and the wynges of ye redde capon with a blewe hedd." (Book of St. Albans.)

Stone Fly (Order *Neuroptera*, family *Perlidæ*, genus *Perla*, species *Bicaudata*).—This fly comes from a water larvæ, called the crab or creeper, which is often used itself, and is a capital trout bait. (I shall consider this bait further on.) It is heavy in flight, but is remarkably active, after it has plunged itself on the water, with its legs. Ronald kept one alive for three weeks, during which time it drank much water. It is used principally for "dopping" (which will also be treated further on), and is a very capital bait for Thames trout. *Body.*—Fur of hare's ear mixed with yellow worsted or camlet, ribbed over with yellow silk, leaving most yellow at the tail. *Tail.*—A strand or two of a brown mottled partridge feather. *Wings.*—Quill feather from the hen pheasant's

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wing. *Legs.*—A hackle stained greenish brown, or a natural dark grizzle. Hook No. 4 or 5, long.

Oak Fly, Downhill Fly, Ash Fly, Cannon Fly, Downlooker, Woodcock Fly (Order *Diptera*, family *Rhagionidæ*, genus *Leptio*, species *Scolopacæ*). —The oak fly is a comical creature to me. No matter where it is perched it always looks downwards, that is, with its head like a thrush struggling to pull out a worm, or like a snipe feeding. When on a perpendicular surface, instead of looking up and down indifferently, it systematically looks down, hence some of its pseudonyms. It is frequently to be seen on posts at the waterside. It is a very good fly for dipping or "dopping." *Body.*—Orange floss silk tied with ash coloured silk thread, which may be shown at the tail and shoulders. *Wings.*—From a scapular feather of the woodcock. *Legs.*—A furnace hackle, *i.e.*, a red cock's hackle, with a black list up the middle, and tinged with black, also at the extremities of the fibres. This should be struck from tail to head, and the fibres snipped off nearly up to where the wings are set on, leaving a sufficient quantity for the legs.

Alder Fly, Owl Fly, in Wales called the Humpback (Order *Neuroptera*, family *Sialidæ*, genus *Sialis*, species *Lutarius*).—This fly is present in great quantities in the Thames, and I have found it quite two miles away from any brook or water, but it really comes from a caddis. It was a special favourite of the author of "Chalk Stream Studies," and is extremely well fitted for dipping or "dopping." *Body.*—Dark mulberry floss silk, or peacock's herl, tied with black silk. *Wings.*—From a feather of a brown hen's or peahen's wing. *Legs.*—Dark umber stained hackle, or, in case of need, a black cock's hackle will answer the purpose tolerably well. Hook No. 3 or 4, long.

Flies for June.

"*The donne cutte.*—The body of blacke wull and a yellow lyste after eyther syde: the wynges of the bosarde bounde on with barkyd hempe. The maure flye: the body of doske wull and the wynges of the blackest mayle of the wylde drake. The tandy flye at Saynt Wyllyams daye: the body of tandy wull and the wynges contrary eyther agenst other of the whitest mayle of ye wylde drake." (Book of St. Albans.)

Green Drake, Man Fly, Cadow (Order *Neuroptera*, family *Ephemeridæ*, genus *Ephemera*, species *Vulgata* [pseud-imago]).—This fly is the pseud-imago of the May fly, and I have not thought fit to illustrate it in its imperfect state, preferring, in place, to give a representation of the imago in the following, or Grey Drake fly. As I have fully given its history in a former part of this chapter, I shall not now add to my previous observations as to its natural history. *Body.*—The middle part is of pale

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straw-coloured floss silk, ribbed with silver twist. The extremities are of a brown peacock's herl, tied with light brown silk thread. *Tail.*—Three rabbit's whiskers. *Wings and Legs.*—Made buzz from a mottled feather of the mallard, stained a pale greenish yellow. Hook No. 5, 6, or 7, long. Many persons hold that it is of little use to attempt fishing with the artificial fly when the May fly is on. The Green Drake is, doubtless, most difficult to properly imitate, but if the directions given are followed a very decent counterfeit may be made, at least sufficiently attractive to pick up a few brace. I shall give particulars of the floating May flies of Mr. Ogden, late of Cheltenham, in a future section of my treatise. At present it is sufficient to say that they are almost perfect, so far as they go. Mr. Francis, after trying all sorts of bodies for *floating* flies, can hit on no plan superior to the employment of straw or maize leaf. Here are his directions: "First get a suitable hook. This may seem a simple matter, but it is not. To make a fly float well, one must have the smallest amount of iron in the hook you can possibly do with. You must, therefore, have a very fine wire and a pretty long shank . . . . Having got this hook . . . tie on your gut; let it be fine, but not too fine, or it will go in the popping necessitated by drying the fly. Then tie on your tail—three whisks of brown hen or pheasant. Then take a slip of nice bright wheat straw, cut it to fit round the shank of the hook, with a nick in the tail end of the straw to taper the body. The slip of straw must come up nearly to the shoulder of the hook, not further; put it into a cup of hot water to soften it, then lap it carefully round the hook and spiral it round to lash it on to the hook with some burnt sienna-coloured silk, taking two or three turns over the nicked end at the tail to secure and taper it and to imitate the brown splotch which is the feature of the insect. At the shoulder you may have two turns of a buff or light sandy red or a light olive hackle, and over this two turns of a bright Florican hackle, which is the best imitation of May fly legs I have ever met. . . . Then comes the wing. . . . For a dark-coloured wing nothing beats teal, as it is a nice shiny feather, and does not wet easily. For a lighter one feathers from the drake do. . . . In size they must be suited to the fly. Choose an even pair, and set them back to back so that the points bend outward, and lash them on upright over the back, and if you like to take a couple of turns of peacock herl, you have the best floating fly that can be made."

Grey Drake, or Glossy-winged Drake (Order *Neuroptera*, family *Ephemeridæ*, genus *Ephemera*, species *Vulgata* [imago]).—This is, as before stated, the imago state of the Green Drake. It is not so killing as the Green Drake, in my opinion, and some prefer other flies in season. I do not. *Body.*—The middle part is of white floss silk, ribbed over neatly

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with silver twist. The extremities are of brown peacock's herl, tied with brown silk thread. *Tail.*—Three rabbit's whiskers. *Wings and Legs.*—Made buzz from a mottled feather of the mallard, stained a faint purple. Hook No. 5 or 6, long.

Fern Fly, or Soldier Fly (Order *Coleoptera*, family *Telephoridæ*, genus *Telephorus*, species *Lividus*).—This is a capital member of the *coleoptera*, and is one of the common insects known as the "soldier" and "sailor." It lives on *aphides* and plant-lice generally, and is especially plentiful on very sultry and hot days. It is usually found near the water, climbing up the stems of grass in search of food, and when it falls in the water it is particularly helpless. *Body.*—Orange floss silk. *Wings.*—The darkest part of a feather from the starling's wing. *Legs.*—A red cock's hackle. Hook No. 2, short.

Marlow Buzz, Hazel Fly, Coch-a-Bonddu, or Shorn Fly (Order *Coleoptera*, family *Chrysomelidæ*, genus *Phyllopertha*, species *Horticola*).—An especial favourite with trout, resembling a diminutive cockchafer. It comes from a pupa inhabiting the earth, and is very abundant by the water side, feeding on poplar leaves and other soft foliage. In the north the name for them is Bracken Clocks. *Body.*—Black ostrich herl, twisted with peacock herl, and made with red silk thread. *Wings and Legs.*—Made buzz with a dark furnace cock's hackle.

Flies for July.

"*The waspe flye.*—The body of blacke wull and lappyd abowte with yelow threde: the wynges of the bosarde. The shell flye at Saynt Thomas daye. the body of grene wull and lappyd abowte wyth the herle of the pecoks tayle: wynges of the bosarde." (Book of St. Albans.)

Wren Tail, &c. (Order *Homoptera*, family *Cercopidæ*, genus *Amblycephalus*, species *Viridis*).—There are several species of these hoppers, and queer quaint little insects they are, dancing about like grasshoppers. They take flights of some ten or a dozen yards at a time, with a rapidity which is to me astounding, and as their flying seems to me to be, *during its continuance*, quite uncontrolled as to direction and termination, they often drop on the water, and thus become the prey of their piscine enemies. They take shelter during cold days on the roots of grass. The pale and dark brown and greenish blue are the most common sorts. *Body.*—Ginger-coloured fur, ribbed with gold twist. *Wings and Legs.*—Feather from a wren's tail, wound on hackle-wise.

The White Moth.—*Body.*—White crewel or white ostrich herl. *Wings.*—A couple of slips of white goose feather. *Legs.*—White hen's hackle.

The Brown Moth.—This is most killing at night time. *Body.*—Yellowish

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brown crewel. *Wings.*—Speckled brown owl. *Legs.*—Light brown hackle.

Red Ant (Order *Hymenoptera*, family *Formicidæ*, genus *Myrmica*, species *Rubra*).—These are very common in mid and late summer, on streams near old fir plantations, or any other well-known habitat of the ant species, and are very killing. *Body.*—Peacock's herl, tied with red-brown silk. *Wings.*—From the feather of the light part of a starling's wing. *Legs.*—A red cock's hackle. Hook No. 00 or 1, long or short.

Silver Horns, or Black Silver Twist (Order *Neuroptera*, sub-order *Trichoptera*, family *Leptoceridæ*, genus *Leptocerus*, species *Niger*).—The male, unlike the female, has black horns. The insect is exceedingly killing, both for trout and grayling, until the end of August, especially towards evening. *Body.*—Black ostrich herl tied with black silk and dressed off. *Wings.*—Feather from the wing of the cock blackbird. *Legs.*—Small black cock's hackle. *Horns.*—Grey feather of the mallard.

Flies for August.

"*The drake flye.*—The body of blacke wull and lappyd abowte with blacke sylke: wynges of the mayle of the blacke drake wyth a blacke heed." (Book of St. Albans.)

August Dun (Order *Neuroptera*, family *Ephemeridæ*, genus *Baëtis*, species *Fluminum* [pseud-imago]).—This is another fly changing to the Red Spinner, and we are told by Ronald that it is quite as important a bait for this month as is the March Brown for March. Mr. Ronald thus dressed it: "*Body.*—Brown floss silk ribbed with yellow silk thread. *Tail.*—Two rabbit's whiskers. *Wings.*—Feather of a brown hen's wing. *Legs.*—Plain red hackle stained brown. Hook No. 2, short."

Cinnamon Fly (Order *Neuroptera*, sub-order *Trichoptera*, family *Phryganidæ*, genus *Limnephilus*, species *Stigmaticus*).—This fly comes from a water pupa, and is of many species. It is chiefly useful after a heavy shower and on a windy day, and is, moreover, very killing. *Body.*—Fawn-coloured floss silk tied on with silk thread of the same colour. *Wings.*—Feather of a yellow-brown hen's wing, rather darker than the landrail's wing feather. *Legs.*—A ginger hackle.

Flies for September.

Whirling Blue Dun (Order *Neuroptera*, family *Ephemeridæ*, genus *Cloëon*, species *Fuscata* [pseud-imago]).—In Hampshire this fly is dressed quite differently from the method practised by both "Ephemera" and Ronald. "Ephemera" dresses it with water-vole fur, instead of the squirrel's red brown fur of Ronald, as per following: *Body.*—Squirrel's red brown fur mixed with yellow mohair, tied with yellow silk thread

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well waxed. *Tail.*—One or two whisks of a pale ginger hackle. *Wings.*—Feather from a starling's wing, not very light. *Legs.*—Pale ginger hackle. The Hampshire style is as follows: *Body.*—The dirty blue feather of the heron's hackle warped with yellow silk. *Tail.*—Dun hackle, with grizzled brown tinge. *Legs.*—The same. *Wings.*—Darkish starling feather.

Blue Bottle, House Fly, or Shade Fly (Order *Diptera*, family *Muscidæ*, genus *Sarcophaga*, species *Striata*).—This is a very useful all-round fly, from early season till late, when they usually become blind on the approach of winter. It is also a very useful fly for "dopping," and I have known it when wild, as I shall hereafter describe, to be particularly useful for that purpose. *Body.*—Bright blue floss silk tied with light brown silk thread, showing the brown at the head. *Wings.*—Feather of the starling's wing. *Legs.*—Black hackle from a cock wrapped down the principal part of the body. Hook No. 3, short.

I must not forget, before leaving this branch of the subject, to give the reader the benefit of Mr. Stewart's experience in the shape of details of his general flies, three of which he terms spiders, and three winged flies. They are killing in the north at least—of that there can be no doubt at all—but let it be distinctly understood I do not give in my adherence to their exclusive use any more than I do to Mr. Pennell's "typical" system. The spiders are merely hackle flies, and are as follows:

1. *The Black Spider.*—This is made with the small feather of the cock starling, dressed with brown silk.

2. *The Red Spider* is made with the small feather taken from the outside of the landrail's wing, dressed with yellow silk.

3. *The Dun Spider* is made from the small soft dun or ash-coloured feather taken from the outside of the dotterel's wing; failing that, from the inside wing of the starling. The lashing of the hook forms the body.

The winged flies are as follows:

1. A woodcock wing, with a single turn of red hackle or landrail, dressed with yellow silk freely exposed in the body. For coloured water it may be dressed with scarlet thread.

2. Hare lug body, with a corn bunting or chaffinch wing; a woodcock wing may be put to the same body, but should be made from the small light-coloured feather from the inside of the wing.

3. Woodcock wing, with a single turn of a soft black hen hackle, or a small feather taken from the shoulders of the starling, dressed with dark-coloured silk.

Having thus furnished the tyro with a list of flies which will ever be sufficient for casual or interrupted fishing, wherever he may find himself in Great Britain, or, in other words, wherever trout are to be found, I

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next proceed to refer to the use of them. In everything is this work suggestive rather than comprehensive. I have fitted up the supposititious tyro with his rod, reel, lines, and flies, and now, bringing him to the water, I bid him use them according to the guidance I offer.

Obviously, the first consideration in this connection is "where to fish." Many persons go to the bank of the stream, nay, to its very brink, with confidence that sport will come to them. They are self-satisfied in the knowledge that they have the right tackle wherewith fish may be taken and that there are fish in the stream. But ere long they arrive at a different conclusion. Trout are among the wiliest of our fresh-water denizens, and are not to be wooed and won without considerable care and caution. Now, it is almost impossible to direct, in terms which shall be utterly precise, the positions in a river in which trout are to be found. Rivers vary so much, that to absolutely fix by arbitrary catalogue any particular spot or spots would infallibly be to delude the angler, and not help him. I therefore simply indicate such positions as may seem of the character generic. These are as follows, in brief: The head and tail of a stream; eddies formed by inferior obstructions, such as a pile or block; where the stream is deepest and quietest; wherever the large masses of foam collect; in very tiny whirlpools during a fresh; and, lastly, in the current between weeds. The reason for the latter locality being given is plain. The weeds harbour numerous water insects on which *salmo fario* feeds, and the swifter stream affords him occasionally food of an ephemeral description as it floats down to his waiting jaw.

This is about all the information one can impart with safety to the tyro. To the experienced angler there are many additions which will occur to him in connection with my enumeration. Under banks, for example, where the comfort-loving chub also prefers to foster himself, many a *salmo fario* has been "tickled," or, as they say in Scotland, "griddled." So, also, as saith the poet:

> The trout within yon wimplin' burn
> Glides swift as silver dart,
> And safe beneath the shady thorn
> Defies the angler's art.

No! No! Mr. Poet, not "defies," but, rather, "stimulates," though the word is not one of measure for your rhyme!

Experience, and true experience only, which implies observation of the closest kind, will decide the selection of each particular spot to which the fly should be thrown, and the part of the river most likely to produce sport. Of course, I am not going to say that there is even then any absolute certainty of fixing—placing one's finger, so to say—on the location of a waiting fish. The said fish may be hunting—hence on the move, hence

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defy human calculation, hence the sport of one phase of the art. What says the old fallacy? "Is there such a thing as motion? Either a body is in one place or else in another. Both simultaneously is impossible." I should, and so would anybody who tried, be simply attempting the unravelment of this rigmarole in giving arbitrary directions for finding trout on the move. As a curiosity, I will wind-up this part of the subject by giving the directions of the "Book of St. Albans" anent the matter:

"The troughte for by cause he is a right deynteous fyssh and also ryght fervente . . . He is on clere gravely grounde and in a streme. Ye may angle to hym all tymes with nyth a grounde lyne lyeng or rennynge; savyng in leppynge tyme and thenne with a dubbe. And erly with a rennynge grounde lyne and forth in the day with a ground lyne." One word more—the best fish are ever found in the best places. This is an axiom.

Before telling my readers "how to fish," yet a few other notes referring to the precautions and general *modus* of trout fishing. These relate to the natural history of the fish somewhat, and are of unquestionable utility. The sense of sight, being so intimately involved in the taking of a fly, demands our attention. I must commence by saying that it is a mistake to suppose that trout cannot see and estimate the size, &c., of a body out of their own element. I am prepared to admit that some fishes are unable to do so, such as the loach and the miller's thumb, these being, from their nocturnal habits and seclusion, naturally predisposed to an amount of laxity of visual power. But the trout is different. It, indeed, is ever on the alert, and probably uses its eyes with greater effect than any other freshwater fish. Fish, and especially trout, as Ronald has demonstrated, can also see more than is usually supposed, *i.e.*, more in quantity of an object than we might be willing, without due consideration, to believe. In an ingenious diagram Ronald has, in his "Flyfisher's Entomology," shown this conclusively. It must, in order even to partially understand what is meant, be borne in mind that water does not receive and transmit the pencils of light falling from air into it and through it in a direct line. The line, by reason of the refractory power, is, indeed, bent, and thus when the angler probably thinks himself unobserved or completely hidden, he is all the time, perhaps, projected in the fish's sight high in the air, and the obstacle which prevented him seeing the fish is no obstacle at all to the fish. I trust I have made what I mean sufficiently clear without a diagram; if not, I would refer my readers to the work itself. The whole fact is based on two well-known optical laws, viz., that the sine of the angle of incidence of a ray of light passing out of and into water is always the sine of the angle of

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refraction, or about four to three; and, secondly, that light will not pass out of air into water if the angle of incidence exceeds about 88 degrees, but will be reflected. The practical outcome of this is, that a low bank in front, or wading, is much preferable for the trout fisher to attempting to hide oneself behind an obstacle near the water. The next points in the natural history of the fish to which it is necessary here to advert, before coming to the full consideration of fly fishing, are the senses of taste and smell, in the trout particularly. Of course the reader is aware that I have rather fully gone into the subject in the chapter "Notes on Ichthyology." It seems that fishes, from the exercise of some discriminating power other than that given by sight alone, have the ability to disregard that which is not their usual food. Trout certainly exercise this faculty in a marked way. For example, trout will not take the honey bee (*Apis mellefica*), yet it is in colour certainly like the March brown fly; and the wasp is also rejected of trout, and the humble bee likewise is not a favourite. The lesson to be derived from this proved fact is briefly this—be careful that each artificial fly is as correctly an imitation of the actual insect as possible. Typical flies are, as before shown, in my opinion, based on but little theory of a reliable nature.

Although Francis pooh-poohs the idea of choosing the weather for fly fishing, I say, from experience, select those warm cloudy days with a slight S.W. ripple, so productive of insect life. The presence of a slight ripple on the water helps considerably to disguise the actual character of the imitation, and is therefore useful, whilst the cloudiness of the sky, presaging rain, stirs up the appetites and expectations of trout, to their frequent destruction let us hope.

True, one may find exceptions without number to arbitrary rules in this respect, but, taking the majority of cases, a regard for what I have said will bring sport. I have taken trout amid snow, but let the tyro be assured that such a feat is very unusual. I do not go so far as the ancient writers did *in re* the governance of creatures by one planet, but, I am nevertheless sure that a full moon influences results in the latter part of the day as regards trout fishing, even as it does as regards eel fishing. Old Gower, in the "Confessione Amantis," 1554, goes further, however, and tells us—

> Benethe all other stont the moone,
> The whiche hath with the sea to doone,
> Of floods high and ebbes lowe,
> Upon his chaunge it shall be knowe,
> And euery Fishe, which hath a shelle,
> Mote in his gouernance dwelle,
> To wexe and wane in his degree,
> And by the moone a man mai see.

as also do other writers already quoted.

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We will now suppose the tyro ready equipped and eager for the fray. By this, of course, I mean he has his landing net, creel at back, tackle book, and rod, &c. He has attached the gut link, and selects a palmer for the end of it. This is called the stretcher, and the other flies are droppers, and the gut should be quite a yard from the stretcher. Usually two droppers and a stretcher are quite sufficient; indeed I know some anglers who never use more than one fly, and this I must confess to preferring myself. However, when fish are small and biting freely, the occasional fun of two on at once renders the larger number admissible.

The supposititious tyro, having now everything in readiness, proceeds to make his first cast. In nine cases out of ten he "pops" off the stretcher in his first essay. But this matters little, seeing the quantity of flies he has still remaining, *i.e.*, if he has taken in the stock above named. However, to avoid cracking off the tail-fly, it is advisable that he affix to an old hook a piece of worsted, and practise at a mark or piece of paper on the lawn or in a field, before essaying to throw upon the water. A degree of proficiency may thus be obtained which is likely to be considerably more genuine than if he at once commenced flogging the water on fish intent. A short line should be tossed, and gradually the length might be extended till a respectable and accurately aimed cast is the result.

What say the received authorities about this operation of casting? Stewart (the best fly fisher of modern times, excepting Ronald) says: "When the line is thoroughly soaked, take the rod in your right hand, raise it with sufficient force to make the line go to its full length behind, and then, hanging for a moment till it has done so, with a circular motion of the wrist and arm urge the rod forward, rapidly at first, but gradually lessening the speed, so that when it stops no recoil of the point will take place. The whole motion of the rod in casting should be in the shape of a horse-shoe, and care must be taken not to urge the flies forward till they have gone the full length behind, or you will be apt to crack them off."

Mr. Francis echoes this advice, and I need not repeat myself by quoting him. Pennell in effect does the same, and adds a piece of advice which I will not attempt to paraphrase in order that it may seem original. He says: "In completing this (the cast), the point of the rod must not be allowed to approach too near the water, but should be kept well up and even; at the moment the line is falling a little upward springy movement of the point should be given. This has the effect of making the flies light *softly and before the line*—two most important points."

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This is what an old writer of about 1660, whose MS. I have discovered in the Sloane collection of the British Museum, says, and it may fitly end my directions on casting:

"Upon casting I wd. do it with a little circling about my head, by waving ye rod, or else ye fly may, with too smart a jerk, be apt to snap off, and so I must stay a quarter of an hour, may be, to get another.

"In casting, I will observe allways to do before me, that it may fall on ye water, and no part of ye line shall dash to scare ye fish, and if I can without making any circling in the water I will. If ye wind be high, I will let some of ye line be in ye water to keep ye fly from being blown out."

Having made the cast, what is to be done? Mr. Francis does not advocate working the fly, as is the style for salmon, but rather to allow, as he says, "the fly to come properly home (*i.e.*, in up-stream fishing), and then make another cast, about a yard further from the bank, and so go on, covering fresh water at every throw, until you have fished the entire water—each throw representing a radius of a quarter of a circle—when you can take a step further up the stream and repeat the process." I confess I like working inert flies with a gentle tremulous motion, intended to imitate the struggles of the insect were it drowning. It is nonsense to say that a fly does not struggle. It really does so on finding out any accident. Look at the fly in your milk jug, brother anglers, for a familiar example.

Of course, I am aware the objection will be urged, "But the fly in question does not move along the water by jerks." Granted; but the working of the fly is the only means whereby it is possible to put life and vivacity into the inevitably unreal. Here the question arises, "would not the fish more unerringly notice the deadness of the imitation fly if it be allowed to float, as recommended by Mr. Francis, than if its struggles were imitated by the 'working' business?" I think it would. Would the accelerated pace be so noticeable as the inanimation? I think not. Therefore, I would recommend my readers to work their flies with a gentle tremulous motion of the top of the rod, whether casting up or down stream.

This brings me to the question which has been much mooted, and may be stated in legal form, viz.: Up *v.* Down-stream fly fishing.

Here is the case of the up-stream fisherman, as ably represented by Stewart.

"The first and the greatest advantage is, that the angler is unseen by the trout. Trout, as is well known, keep their heads up stream; they cannot remain stationary in any other position. This being the case, they see objects above and on both sides of them, but cannot discern

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anything behind them, so that the angler fishing down will be seen by them twenty yards off, whereas the angler fishing up will be unseen, although he be but a few yards in their rear. The advantages of this it is impossible to estimate. No creatures are more easily scared than trout, &c. . . . .

"The next advantage is, the much greater probability to hook a trout when it rises. In angling down stream, if a trout rises, and he strikes, he runs a risk of pulling the flies straight out of its mouth; whereas in fishing up its back is to him, and he has every chance of bringing the hook into contact with its jaws. . . . .

"Another advantage of fishing up is, that it does not disturb the water so much. Let us suppose the angler fishing down a fine pool. He, of course, commences at the top, the place where the best trout and those most inclined to feed invariably lie. After a few casts he hooks one, which immediately runs down, and by its vagaries, leaping in the air and plunging in all directions, alarms all its neighbours, and ten to one if he gets another rise in that pool. . . . .

"The last advantage of fishing up is, that by it the angler can much better adapt the motions of his flies to that of the natural insect." . . In order to substantiate this, Mr. Stewart, after some circumlocution, asks the question: "Is it not much more natural to throw the flies and let them come down gently as any real insect would do?"

To all this Mr. Francis has not a word to say in opposition. Pennell, however, says: "As a rule the best mode of fishing rivers is to cast *down and across* the current, beginning under the further bank, if possible, and ending under the near one. In spite of Mr. Stewart's able advocacy, most anglers have now arrived at the conclusion that fishing up stream always, or even generally, is a mistake in practice." On the publication of this a war of words ensued in the *Field*, in which Mr. Pennell justified the above opinion by answering as follows.

As regards the assertion of Mr. Stewart, that "as trout always lie head up stream the angler fishing from below is less likely to be seen than one fishing from above," he says:

"The position of the eye of the trout is such as to enable him to see much more readily anything above, or on one side, than in front of him and in rippling water, such as trout streams usually are; the angler making moderately easy casts will, for all practical purposes, be out of the ken whether he stands above or below."

Now this is very vague and is really a weak answer, forasmuch as that it often is exceedingly desirable that the angler should throw a short line and not long. The sight of trout, as before stated, is very sharp; why,

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then, allow the possibility of their seeing the fisher, if by fishing up stream this can be prevented? Mr. Stewart's own answer is too contemptuous for me to quote here.

As to the second proposition of Mr. Stewart, that "the angler striking from below is likely to strike the hook into the fish's jaws, whereas the angler striking from above is likely to pull the flies straight out of its mouth," Mr. Pennell replies:

"This is true as an abstract proposition, but, as applied to the question of fly fishing, is quite untrue; when the fly is being drawn straight down stream, the trout rising from below is forced, owing to the position *of the gut, to turn round before he can take the fly*. So that at the moment of rising the fish would be in precisely the same position with regard to the angler whether the latter were fishing up or down."

Notwithstanding Mr. Stewart's assertion, that "had Mr. Pennell stated that trout turned a somersault or two before taking the fly, it would have been quite as probable in theory and correct in fact" as the statement italicised above, I am quite with the author of "The Modern Practical Angler" in the quotation given. In taking a fly when fishing down, the fish seeing it coming rises and turns without much difficulty. Similarly this is the case when fishing up stream. His answer is a perfectly just one, and the subsequent correspondence did not, to my mind, injure its integrity.

The argument that up-stream fishing does not disturb the water so much is unanswerable, and on this and the first Mr. Pennell fails. Up-stream fishing is *the* style when learnt, but it has the disadvantage that its acquirement is exceedingly difficult, whilst the down-stream style is also the more available. I always fish *up and across* if possible. I likewise always give a slight motion to my flies in their descent. Therefore it cannot be said I am a partisan of a very bigoted order, after my preceding remarks. Notwithstanding this rule of mine, I confess to sometimes casting down where a long cast can be made, and I strongly advise the tyro to do so himself with judgment and not to tie his practice to anybody's theory but his own.

As I have said, Mr. Francis goes with Stewart *in toto*. So be it. I have found it sometimes beneficial to allow my flies to descend somewhat towards the fish, as one does with a dry fly or the natural insect, and this without a lot of slack line is impossible, if one persistently throws up and across without variation.

As I have before somewhere insisted, a variation from acknowledged rules, made with judgment, is the best mode of fishing, and the man who cannot tolerate a deviation is no real angler. Narrow-mindedness has

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no part in the gentle craft, the principles of which in their variety are philosophical to a degree.

At night time it is absolutely necessary one should fish down, as the slack line will give no intimation, in nine out of ten cases, of the rise. The fish at such time are on the look out for any insect moving, and are by no means loth to rise in a general way. I do not care much for night fishing, however.

There is another method of casting which is especially efficacious when the wind is adverse, or when there are trees or other obstructions at the back of one, preventing a free delivery of the line. It is termed "snitching." In this method the angler raises the rod high in the air perpendicularly, and when the flies are almost at his feet in the water, he, by a sort of downward cut of the rod, twirls the line till it assumes the arc of a circle towards the point aimed at. This plan is also useful in salmon fishing.

Having thus adverted to the systems of up and down fishing, some remarks are necessary in regard to the striking of a fish. For myself I almost always use a stiff rod, and I therefore almost always allow a second or two to elapse between the taking of the fly and the strike when using the ordinary limber rod, which slightly curves when held in a horizontal position. I admire striking at once, because the first movement of the hand in the act of striking moves the point *forward* front and then back. I am aware that there are many anglers who prefer not to strike at all; but this, I am persuaded, is by no means the accepted rule, and it is, so far as my own experience is concerned, *wrong*. Still, I am willing to admit there are conceivable cases when the rapidity of the stream or the characteristic abruptness of the trout renders striking an exceedingly doubtful proceeding.

The strike, when made, ought to be a quick twist-motion of no extraordinary violence, proportioned to the fragility or strength of the tackle in use.

Before passing from this portion of my subject, perhaps I may be allowed to utter a few desultory remarks in reference to the most advantageous methods and styles of working the various likely spots of a stream or river. I have before noticed the insuperable difficulties of communicating directions of a nature likely to always be of precise use, but it is quite possible to convey such hints as may be of general use when utilised "judgmatically."

Always throw near first, and afterwards far, to the extent of ten or a dozen yards, or even more. After the flies are on the water they may be allowed to float beneath the surface. Stewart lays stress on their noiselessness and immoveability, that is, apart from the movement naturally

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given rise to by the stream. I am an advocate for trying every likely nook two, three, or even more times successively, and an eddy which suggests itself as of trout trouty must not be lightly disregarded. In every case this maxim may advantageously be kept in mind: "Try every nook and cranny, every portion of the stream whatsoever, before resting satisfied that there are no fish likely to come to bag."

On hooking a trout the first mental quality necessary is deliberateness. All flurry is inimical to the proper playing of any fish, and especially is this so with trout. The excitement, which is so delicious, becomes chastened after the angler learns his craft, and though there be much abatement of the nerve-disturbing ecstacy in the capture of the hundredth trout as compared with that of the capture of the first, nevertheless the pleasure is of a greater, more satisfying, nature. A poetical friend of mine suggests a comparison as I write. He says that there is as much difference between the first glow and thrill of amateur trout capture and that of later date as between the bliss of the ardent lover and the love of the husband who has won his quest. The parallel cannot be quite followed though, for I am anxious to enjoin a moderation of transports in the novitiate of the angler, whilst one would scarcely have the temerity to suggest a lesser degree of ardour in the successful lover.

Having, however, risen and hooked the fish, let us suppose the tyro is ready and willing to behave like a sane man, and calmly endeavour to play it with a determination of conquest. In such case he must not forget the necessity of keeping his rod well up, that the strain may be on it, and not so much on the line. This is very essential in regard to a large fish. I am personally very harsh to a trout, possibly because I am somewhat *blasé* in fishing, and partly, may be, because of the stiffness of the rod I use. I object to allowing a weak half-pounder to upset the lower portion of the stream (after dealing death to salmon and Thames trout), but with a two-pounder the case is different. One has to be excessively careful that the line is free on the reel, and that the rings do not intercept it, or woe to the fine gut line and rod's top. Never, however, let out line if it can be avoided. If wading, speedily get to shore to try keeping up with the fish, providing this can be done without very great exertion or the chance of disturbing all the fish in the locality. At the same time it must be carefully observed that a slack line is most evil, for if the hook be only fixed on the bone, as is sometimes the case, the fish will be able to shake it out, and, in addition to this danger, there is that of the course of the fish not being correctly known, whereas a taut line indicates it unerringly. If a fish takes you into a weed boldly endeavour to irritate him to action. It is much better that he should

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get out himself than that you should endeavour to pull him out, for in the latter case trout have an artful and effective knack of spreading out their fins when they object to coercion, and thus retarding their passage in a manner not only irritating to the angler, but destructive in the majority of cases to his tackle.

The landing of a fish should always be most deliberately done. It is much better to play it for a few minutes longer than endeavour to skull-drag it out, or to endeavour to get it into the landing net before it is fairly exhausted. If it be hooked in the mouth, say the upper lip, the unvarying strain of the line soon so interferes with the free play of the gills, as to induce a sort of suffocation, which, if it does not absolutely kill the trout, tends greatly to stupify it, and render its struggles objectless, and, indeed, without plan. On the other hand, if it be, as is very often the case when trout are rising freely, hooked in the fins or other part of the body outside, its water powers are not materially interfered with, and very often piscator plays for a considerable time a fish which appears of ample weight in the water, but afterwards turns out of inferior size—much to his disappointment.

Should the fly get entangled in a weed of the ordinary brook kind, the lay of which is down stream, let him even retire down stream, and then endeavour, with moderate force, to jerk it free. This is the plan to be preferred before a steadfast pull, because the thin steel of the hook will often cut the weed when an exertion of strength would not result in the breakage of the branch of weed.

The young angler very often gets "hung up" in a branch of an opposite tree. This is a most common occurrence indeed with even the experienced fly fisherman. Of course, the more expert the angler becomes in throwing the fly to a particular point the less is the chance of such a disaster. However, when such an emergency arises there are several methods of endeavouring to get free. The first is, of course, to try the "jerk judicious;" the next is to tie a bullet to the end of a stoutish string, and try to throw it over the twig in question. Having accomplished this, gently sway it backwards and forwards till a close entanglement has been effected, then away comes twig and all. A kind of knife, with a hollow handle, which can be placed on to the top of the rod, so as to sever the branch, has been devised. Mr. Francis gives a drawing of it, and its usefulness is often great. After all, however, the experienced angler has but seldom to resort to any other expedient than the "jerk judicious."

I am exceeding fond of using the dry fly, and on clear bright days fish may be killed by this bait when the wet fly is of no avail. The flies, duns for example, as they make their appearance on the water on a bright

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day with dry air, do not get half drowned as soon as they alight on the water. On the contrary, they seem to jauntily rest themselves on the surface of the stream with wings dry and repellant of the water. Then are they most tempting and toothsome morsels for the fish. In such case, it would be against the dictates of common sense to persistently fly-fish in the ordinary fashion. Use, therefore, the fly in season dressed as described for fly-fishing, viz., with the wings turned outward, and, before casting each time, give it two or three turns in the air to dry it. Deliver it with the utmost care that it falls lightly, and then gently raise the rod as the fly approaches your feet. Persevere with the fly if the fish notices it at all, until, by its very importunity, he cannot resist taking it.

Mr. Francis thinks one can almost make a fish think there is a rise of some particular fly by so doing. I once whipped for three hours over a *nonchalant* old trout of 4lb. at Chenies, and then got him. It will have been noticed in the details of the list of flies I have given that little or no mention has been made of the size of the hooks or proper size of the flies. This was because both of these points ought to be decided by the size of the insects on the stream about to be fished. Failing to ascertain this, I would recommend that size of artificial fly which corresponds with the size of the natural insect. The size of hook is determined by the size of the bait, and a sense of proportion will therefore dictate what it should be. In tackle making I give the various sizes, and I leave it to the experience of the fisher to select the fittest.

When speaking of the selection of size for any particular water, Stewart says, "The two great causes which should regulate the angler in selecting the size of fly to be used are the colour and size of the water, and the wariness of the fish, in fact, it *must be large enough to ensure its being seen, but not so large as to enable the trout to detect its artificial character.*" This is very vague, and, moreover, it is not reliable. It is a fact that some rivers require large flies and others small, but I am persuaded that the indigenous *natural* flies regulate this, and not the depth of the water nor the trout's wariness only. Unquestionably, however, these two "causes" are necessary to be observed, and besides the comparison with the native fly of the locality which I have recommended, I would suggest that when fishing over deep water a large fly be used, and also, that when the river is of dark-coloured water, large flies be utilised. In fact, the duller and darker outward surroundings are, the larger the fly; the brighter and clearer they are, the smaller and lighter they may be.

In a former part of this work I adverted to the American idea that

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trout are occasionally "colour" blind, or afflicted with what in the *genus homo* is known as Daltonism. Since that paragraph was written I have tried very hard to arrive at some conclusions for my readers, but with a success of such limited scope as not to justify my pronouncing yea or nay yet. I am, however, convinced that, owing to a prevailing hue of water and surroundings, trout exhibit a partiality for one particular colour. More I cannot say at present.

I have said I do not like night fishing—neither do I. It savours to me of poaching, and consequently is not quite "the thing."

During the hot weather trout not unfrequently remain until evening comes on before attempting to seek for food. In the daytime they lie somnolently under banks or in quiet corners, whence they will not be tempted. Especially do the larger fish affect this course of behaviour. Night fishing in such a case is very effective, and by some greatly liked. Its details of style are as follow: The flies used are the larger ones, such as the cinnamon, alder, or white moth, and the casts ought to be made down, because in the twilight one cannot nearly so readily perceive a rise as in daylight, and many a fish would be missed because of the slack line if up-stream fishing were resorted to.

The casting line may be stout and strong, and it is advisable to have another one or two in readiness to slip on in the event of a breakage. The spots where fish are to be found at night are pretty much the same as in the daytime of a favourable day, only perhaps more afield, for they must feed some time in the twenty-four hours, at least, it is a fair assumption that they do, and if they have not done so in the day they will at night. After a fish is hooked it is policy to kill it as soon as possible. Trust in night fishing to your perception by the feeling of a bite rather than to sight, and in all cases where a rise can be seen drop the bait into the ripple made.

The fishing of still water is almost similar to fishing a river or stream, taking into consideration the difference of surroundings. Any angler well versed in trout fishing on a river will readily pick up the methods pursued on lakes. Of course it is necessary, in the case of still water, to "work" the fly, and against the practice in the case of such water there can be no appeal. Of course I am exclusively referring to artificial fly-fishing. Other baits require different practice as will be seen.

Thus, in the foregoing pages, have I endeavoured to succinctly give directions for fishing with the artificial fly that the tyro with intelligence at his command might catch fish whenever he may chance to seek a trout stream for that purpose. I can conceive of nothing more delightful in this life than, rod in hand, and fly-book in pocket, to seek the sweet streams of Devonshire, or the pools and burns of Wales, or the "wimplin"

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waters of some Scottish loch or fairy streamlet. What can be more delightful, on some "incense breathing morn," than to climb the summit of the hill, and gaze on the thread of silver below, 'mid verdurous fields and foliage of varied hues, towards which you intend wending your way, rod in hand; or by the Colne or Wandle to stroll, taking in with each step deep draughts of beauty—the tints of May, the songs of her glad-throated birds, the glorious vagueness of the blue cloud-pillared vault above—what can be more delightful? Verily, as Sir Henry Wotton hath said, angling such as this is "a cheerer of the spirits, a tranquiliser of the mind, a calmer of unquiet thoughts, a diverter of sadness" into paths of pleasantness and peace unknown of the moles of the great cities, who, like Hood's songstress, know little of the "breath of the primrose and cowslip sweet, the sky above my head, and the grass beneath my feet," but yet are content to remain in ignorance. In conclusion I may perhaps be allowed to call in the aid of the poet Gay for the enforcement of what I have primarily endeavoured to teach in the foregoing pages:

Think well the various seasons of the year,
How the succeeding insects rare appear.
In the revolving moon one colour reigns,
Which, in the next, the fickle trout disdains.
Oft have I seen the skilful angler try
The various colours of the treacherous fly.
When he with fruitless pain hath skimmed the brook,
And the coy fish respects the skipping hook,
He shakes the boughs that on the margin grow,
Which o'er the stream a wavy forest throw!
When, if an insect falls—a certain guide—
He gently takes him from the whirling tide,
Examines well his form with curious eyes,
His gaudy vest, his wings, his loins, his thighs;
Then round his hook the chosen fur he winds,
And on the back a speckled feather binds.
So just the colours shine through every part,
That Nature seems to live again in art.

I have now arrived at that part of my subject which may be comprehended under the title real bait fishing, and, therefore, the use of the real fly next demands my attention.

There are several ways of using the real fly, and each is very killing. The first, and, perhaps, most favourite, when a favourable wind is blowing, is the blow-line, with either the real May fly, palmer, or blue-bottle. This style has been explained in the article on Dace, so I shall not again repeat it, but content myself with simply reminding the tyro that the tackle consists of a long somewhat stiffish rod, a very light silk line, a fine length of gut, to which is attached a single hook on which the fly is impaled. Another and more elaborate style, is one almost

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identical with *artificial* fly fishing. Its difference merely consists in the use of a *natural* fly. In casting this natural fly, the great thing is to avoid roughness or any cracking of the hook behind, which sometimes occurs with the artificial, but which, with the natural fly, at once cuts the bait off the hook. A 12ft. or 13ft. rod, made very light, and rather more pliable than ordinary fly rods, having the rings large and close together, is the most suitable. The rings being upright make the rod bend more equally, and the line runs more freely. The best tapered line (silk and horsehair), very light, is to be preferred. Get two lengths of strong gut, and splice them to your reel line, tapering them down to your casting line, which should be at the very least 8½ft. or 9ft. long, of the finest gut that can be got, the hook a No. 8, fine in the wire, and of exceptional temper, so as not to over-weight the fly. Put the hook through the thorax of the bait; then let out as much line as you find by experience you can cast.

The operation of casting the fly is now as follows: Take the line well above the baited hook, between the left finger and thumb, for the first cast; let the line hang down from the point in a bag or curve, then wave the point of the rod gently backwards and forwards until you get the line on the stretch, when make your cast, releasing the line at the same moment. Let the fly and as much of the line as is required rest on the top of the water; cast as much up stream as possible, and, as the fly comes down towards you, steadily raise the point, but take care not to put any drag on the fly. Let the fly travel on as far as it will go without check; when it can be allowed to go no further, it must be fetched off the water as lightly and smoothly and with as little wetting as possible; a semi-circular sweep of the rod point must be taken, to avoid popping, and a smooth cast up stream once more made. When the fly has been drowned two or three times without getting a rise, it will no longer float, and a fresh one must be put on. Some anglers use two flies on the same hook, alleging that they float better, and are more attractive. A very little wind, and that at your back, is desirable. Mind particularly to keep wet the length of gut which your hook is fastened to, by drawing it through your lips before making your cast, so that there is no dry gut on the surface. A very great deal depends on striking your fish. When a fish rises at your fly, suffer him to take it well before striking.

A cockchafer is a splendid lure, and rarely fails to obtain good sport. The insect should be threaded by means of a baiting needle from the head to the vent, and the head brought down to a small triangle. A light quill float might be used with advantage, and one swan shot above the bait at a distance of about a foot is commonly sufficient to sink the

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cockchafer, which thus goes down the stream with wings expanded, owing to the tension of the line between it and the rod, and the pressure of the stream on the reverse of its wings. A cockroach treated in the same way is a splendid, and, in my experience, an infallible bait, but it is very tender, and requires frequent changes.

Dipping or dopping is also, in thickly-wooded districts, exceedingly efficacious, but requires great patience. Get a small triangle and tie it on to the finest gut, using generally about 2ft. of gut. This being done, with a good supply of flies, proceed to your selected place with the greatest caution on your knees. Pass the rod and line through the bushes, and gently lower the bait to the top of the water, raising and lowering it with a tremulous movement. Now the greatest care must be taken when the fish is hooked in having your line all free, so that you may let go your little finger in a moment, or you are undone. There is no occasion to strike your fish; and remember that not any part of the gut touches the water, but your fly only; and when you see the fish coming towards you, keep your fly *still*. To be truly successful it is well to make a mental note of every hole containing a good fish, so that when you commence fishing there may be no loss of time in selecting a spot.

Many a goodly fish have I captured with the common bluebottle. Let me, dear reader, step down from the stage of personal experience and watch my oft-used supposititious angler make use of it. It will be a relief to me to drop the everlasting *ego* so pregnant of assertion in angling books.

Down in yonder glade, through banks of verdure and thick undergrowth, beneath the woven Gothic arches of the trees, runs a swift brook with a refreshing sound, over white shingles, and round and about dainty nooks, containing the meditative and sluggish trout. Through the spaces of the branches the hot sunbeams fall glistening. Everything is still—not a breath disturbs the surface of the water. Our angler approaches closely, but cautiously, and parts, with slow haste, the thick alder branches, and gazes on the stream below. Immediately aroused, even by the reverberation of his quiet step, out rushes the agile graceful form of a trout. Swift as a lightning flash he darts across into the recess beyond. By the lashing of his powerful tail the glories of his incarnadined sides are revealed. The bluebottle aforesaid is destined to capture him, and in this wise. Taking up his position amid the umbrageous branches, out of sight of the water, if possible, our angler draws from its case a short stiff rod of bamboo, and a noiseless Nottingham reel, covered with stout undressed silk line of great strength. These are put together, and a fine gut bottom is attached to the line, and connected with this is a medium-sized well-tempered hook. Just above this is a

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shot, the use of which will be seen presently. Now, from the mysterious depths of a capacious pocket, a bullock's horn, pierced with holes, is drawn, and the cork lifted. A bluebottle, dazed and tamed by the previous darkness, slowly makes his appearance, to be taken between the fingers, killed, and impaled on the hook. All being ready, the rod is carefully protruded through the bushes, and, the bait being dropped into the water, the shot sinks it to where our trout is supposed to be lying *perdue*.

Now mark the care and interest manifest in the heated face of our puppet-angler. See how rapidly he becomes cool, deliberate, and comfortable, gently and slowly he lifts and lowers the bait with an enticing movement. Perhaps, with the instinct of an accomplished fisherman, he has become aware of the contiguity of his quarry, but has hitherto not succeeded in tempting it to take the bait. Suddenly, however, he strikes, and, with a splash and a roll, the trout is making valiant efforts to escape. Now the utility of the strong tackle is prominently demonstrated. No gentle handling, as with the ordinary fly tackle, can be allowed, or entanglement would result. Steadily and resolutely the fish is killed and bagged. And so sport continues till the heat is forgotten, and the sun slowly dips beyond the hills. Then does our piscator desist with a glad heart. Around circle the voices of the evening. The "melodyous armony of fowles" is a fit evensong. Insensibly, as he wends his way along tortuous footpaths and through odorous meadows, the soft poetry of the scene steals over his senses soothingly, and with a sweet music of peace. The monotonous landrail is the bass to the hedge warbler's treble, and from the wood anigh the nightingale thrills his heart with an eddying sea of song. The gurgle of the waterbrook, and, perhaps, the dying thunder of the weir are voices in the great choir whose subject song is night. The gloaming comes down thickly, dyeing the distant hills a purple hue, and our angler returns to his cottage or inn, after the good old Waltonian style, to have his "fair trouts" dressed for supper, and then to bed, between lavender-scented sheets, to dream dreams of quietude and peace.

As indicated in my explanation of the natural history of the May fly, the creeper or crab is a very deadly bait, and is largely used by fishermen who want to make a basket at any rate. For my own part, I would do away with such fishing on rivers supposed to be preserved—but I need not go into the ethics of the subject here, where I am supposed to be explaining the "how" simply, and not the "why."

The creeper is the larva of the stone fly, and is easily caught as follows: Stick a fine net in the water where they may be expected to be found, then go some yard and a half above and disturb the gravel with

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a rake. This arouses the creepers, and they drift into the net. They are horrid looking objects, but their efficacy overcomes one's repugnance. April or May is the best month for their use. In fishing with them, those in the best condition—not the largest, but the yellowest—should be selected. They may be kept for days in an ordinary canister, with a little wet weed or sphagnum moss.

The tackle necesary is a length of gut—about four feet or more—of fine texture, and a sort of adaptation of the Stewart worm tackle, *i.e.*, two No. 7 hooks tied closely together on the gut. Take the creeper and pass the lower hook crossways a little above the tail, then take the upper hook and put it through about the shoulder, according to the size of the bait. Thus the creeper is effectually kept in a stationary position, and it therefore lasts longer than would otherwise be the case. A split shot may, in very rapid streams, be pressed on the gut about a foot or so above the bait, but ordinarily this is not wanted. They are most useful in a swift stream, but care should be taken not to allow the bait to sink, as it is so very tender that it either comes off in such a case, or it is so damaged as to be of but little subsequent use. The cast must be made upwards and outwards, and the eye ought to take note, as well as the wrist, of any stoppage in the course of the creeper. Strike at once on any such stoppage appearing, It should be noted—a fact I forgot to state before—that the creeper is not always the larva of the stone fly, but occasionally belongs to the *Palidæ*. I have found them develop into the *P. marginata*.

Minnow Spinning.

Spinning for trout is known to be one of the deadliest, perhaps *the* deadliest, legitimate method of taking the fish. Under the word "spinning," of course, I include (as the bait are real) small fish, and such artificial devices as may have been or are found efficacious. I will divide the subject into two sections—spinning with the *real* and spinning with the artificial bait.

Spinning with the Real Bait.—Why does a trout take a spinning bait? I think the following explanation from Wheatley's charming book, "The Rod and Line," will perhaps answer the question: "With regard to the trout there is a curious fact—he will take a spinning bait even in the midst of living minnows. This singularity must have been noticed by many as well as by myself. It has been accounted for, and, from my own observation, I think correctly, by supposing that a fish of prey will sooner seize upon a brother in distress, a wounded fish, than upon any other, because it is most easily captured. This presupposes something of a human, not humane, feeling, and was exemplified in perfection when

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I was at school—that blessed time of birch before breakfast, drubbings before dinner, and tears before tea. A poor friendless boy was the butt of the school, and, whenever he was knocked down, up rose the cry of 'Oh! kick him—what fun! he's no friends.' And this seems to me the case among other animals. In domestic poultry the injured hen is pecked at on all sides; the wounded stag is driven from the herd to die in solitude. The unfortunate of the feathered, furred, and every other race are either scorned or hunted, often both. The scaly tribe affords no exception. I have several times seen a minnow or small dace that was either marked by some accident, or had, no doubt from injury of one kind or other, an odd waddling sort of motion in swimming, seized upon by a trout in the midst of its fellows who were in full health, vigour, and beauty; close past all of these rushed this fish of prey, and gobbled up his damaged morsel with great apparent gusto."

My experience and observation exactly coincide with the foregoing exposition. I am persuaded that, except in a few cases, the trout really mistakes a spinning bait for a wounded fish. The exceptions to this rule, in which he takes anomalous creatures, suggesting no semblance to a fish—such as a spoon bait painted red—are to be explained in the same manner as that employed by me in accounting for the taking by a salmon of a grilse or salmon fly.

But to proceed with the subject. First, as is my wont, let me describe the *beau idéal* of tackle. The rod for brook trout spinning ought to be lighter than that necessary for Thames trout fishing (described further on); in fact, that used for worm fishing, if, as I enjoined, the rings be made distinctly large, will do capitally. A three-joint bamboo, of about 14ft., is a useful rod for all angling. So I advise my readers to select one from a good maker, and have two or three extra tops made for them. In such case they can fish either with blow line, or dopping, or with the worm or spin, as opportunity presents or occasion requires. For my own part, I use the Nottingham-built rod and throw from the reel; the reel and line being of course of the Nottingham make also. Mr. Francis recommends the finest dressed eight-plait line, or even Derby twist. The former line is right, but a twist line is very apt to kink and render itself a complete nuisance unless it be thrown from the reel. If the line is used in the ordinary way, by drawing out and coiling, a winch is to be preferred, and a dressed line is indispensable. I occasionally find this style preferable to the other, and in that event coil the line almost invariably in my hand—left or right, as required. A throw can, in such case, be made from ten to twenty yards, always supposing, of course, as Dr. Lynn would say, "you know how."

In choosing the trace I contrive in all cases to taper it, and its length

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(of the best gut) ought not to be less than four feet. Four double brass swivels, at intervals of a foot, are affixed, and each end terminates with a well tied, or whipped and tied, loop. The weight already indicated by me is to be used, and experience will dictate the size of this and its position on the line. It is readily fixed, and thus the entire trace is complete.

It is not easy to over-estimate the value of a movable sinker in trout spinning. One begins fishing, perhaps, in a pool of eight or ten feet of water, where a weighty trace is required to sink the bait to its proper place in relation to the position of the trout therein. Of course, in such an instance, a heavy lead is advisable; but, if the particular trace of the ordinary immovable lead pattern be in use, delay must ensue before another trace can be affixed. Perhaps, in a few moments after the pool has been well tried with the proper sort of trace, the angler wishes to pass on to a shallower part of the stream below. A change of trace is again necessary, and so on—this is, be it understood, with the ordinary trace as now sold. But my lead can be attached or detached as inclination and judgment prompt. Hence its superiority. Of course I am now referring to those traces whereto the lead is not attached, but placed in the bait. In the case of the latter the 4ft. trace may be still used, as well as the double brass swivels. Gimp need never be used as a material for the trace.

The various tackles — all possessing excellencies of design — are in number legion. I give illustrations of the best of them in Tackle Making. I give preference to the Walton H., the Pennell, and the Francis, but the one which has most unfailingly brought me sport is what I call the Keene arrangement. This may be an invention of my own, for I never copied it, but I am assured that the design is old; anyhow, I have never seen it figured before in any angling book, so I claim it. Perhaps I cannot do better here than give a general description of the characteristics of the various tackles figured.

Stewart's is one of the oldest and best of methods for the natural bait. It consists of a large hook at the end of the gut, and about two inches above that a small one; attached also to the gut near the small hook is a "flyer," or a length of gut, to which a double loop or triangle is attached, so that it hangs a considerable way behind the bait. This is to insure the hooking of a short-biting fish, and is by no means beloved by me in consequence. I confess I do not like fly triangle hooks, or, indeed, any flying hooks at all, for the matter of that; they savour of catching a fish without bait—the foul-hooking business. This is how it is baited, as described by Mr. Stewart himself: "Take the large hook, and entering it at the mouth of the minnow, run it right through the

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body and bring it out a quarter of an inch from the tail, leaving the minnow as nearly as possible in the curve represented in the cut. The object in having the minnow in a curved form is that it may turn round when it is drawn against the stream, and this can be better accomplished by a small curvature than a large one. If the body of the minnow is almost doubled up, the spinning is horrible to behold, and much more likely to alarm than attract a trout. The smallest curvature will do, and the hook should protrude freely. The upper hook is then stuck through the lips, which completes the process, and the angler should, before commencing, draw it through the water to see it spins properly."

Pennell's two devices are capital ones. The first represents his modification of the pike spinning tackle for which he has become so noted. Anyone looking at the pike tackle can see how the affair is baited; the faint lines represent an additional triangle if such be desired. The other is a very valuable sort of tackle for such anglers as throw from the reel. It comprises a lead, which is inserted in the mouth of the bait, and thus a definite weight is projected directly from the angler.

The Francis tackle is also very good, as is that recently described by Walton H. in the *Fishing Gazette*. Each device is amply described in the section of the work devoted to the explanation of such matters.

Spinning with the fan tail is a favourite method in some rivers, and deserves notice here before adverting to artificial baits, for it can hardly be termed an artificial lure.

The tackle used for fan tail is of the same character as that used by Stewart for the minnow, and, as will be seen, is shown with the bait *in situ*. It is of use at the same time and under similar conditions as the minnow, and by some it is even said this bait excels the minnow in effectiveness.

Artificial minnows (*et hoc genus omne*) are very convenient aids to the spinner's art, but, no matter what may be said by even such an authority on them as Wheatley, I cannot admit the artificial minnow to be in any case more destructive than the natural bait. As with the natural fly, so with the natural minnow. With characteristic egotism Mr. Pennell thus refers to the minnow baited in his own style: "As compared with the natural minnow baited and used as described, I am satisfied there is no artificial imitation hitherto made public which is worth mentioning." As was the case when these words were written, so is it, I maintain, now. I will admit that, when Hewett Wheatley wrote, his baits were superior in retaining power to the *natural* bait tackles then in use, but it was chiefly because the arrangement of the hooks in such tackles was exceedingly defective and unreliable. His, on the other hand, in the

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majority of cases, were perfectly arranged, or nearly so. Hence, when a trout did rise at one of his baits, he almost infallibly hooked him. I have some artificial baits, made by Mr. Gregory, of Vyse-street, Birmingham (of which I shall speak more particularly anon), which are simply beyond criticism in this respect. So also is the arrangement of hooks in modern minnow tackles, and hence the superiority of the same.

Another reason why artificial baits are not likely to be triumphant over the natural bait lies in the fact that trout soon *learn* the nature of an artificial bait if it be used frequently on the same stretch of water. This is not the case with the natural minnow. A trout may feel the hook and get away, but he is nevertheless quite prepared to vouch for the identity of the natural minnow, whereas, if his jaws close round a hard piece of brass or German silver, and he ultimately breaks away, his feelings have been so rudely shocked, and his understanding so absolutely awakened, that he never forgets the sham. This theory is borne out by experience, fanciful as it may seem.

The method of throwing a bait has been sufficiently explained in the chapter on Pike (pp. 141 to 161), and I need only further add, that too much stress cannot be laid on the desirability of quietude and deliberation of movement. Some anglers cast with an underhand motion, but I do not care for it unless a short distance only is desired to be attained. In such case the underhand style may with advantage be adopted.

Where to cast is a question of some interest. First, it may be said that my experience leads me to advocate chiefly *up and out* casting. When the bait is first rounding the segment of the circle, which it describes before being down stream in position, the trout are most generally hooked. It would seem that the fish follows the bait down, and then, as it turns to go up stream, as it were, seizes upon it as if fearful of losing it. Very often it is advisable to fish down; but this is to be regulated by circumstances, as in worm and fly fishing.

In fishing flooded waters I usually throw across and work it gradually round with a sort of sink and draw motion of the bait. Naturally, in this style, it is advisable to use a very light weight—in some cases a swan shot placed loose in the mouth of the bait is sufficient. Of course, the mouth of the minnow being closed by the lip hook, this shot is there retained. In every case it is needful to take care that the bait be not drawn out of the water with haste or abruptly, because, as is often the case with pike, the trout sometimes follow, and at the last moment jump at it. In all cases before striking let the trout turn, then fix the steel with one or two sharp, but not too determined, strikes.

Fishing in clear water is, of course, more difficult than in water so

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thick that the fish cannot therefore discern the angler. The minnow should be well weighted, so that the following trout may not have the chance of clearly discerning the angler. Throwing, as before indicated, up stream and out is at this time the most approved method.

There can be no certain rules given as to the niceties of trout minnow spinning. Under the banks, at the foot and eddies of falls mid-stream, in quiet pools, all have their fascinations as places of resort for *S. fario*. Constant practice, as in fly-fishing, can alone make the tyro an adept. This is really all I can say as a conclusion.

Before going from the subject, however, I cannot refrain from referring to what I consider an error on the part of that great trout fisher whom I have quoted so often—Stewart. He says, referring to the generally received opinion that trout take minnows head first: "From observations taken when the water was clear, we think that five trout out of six seize the minnow from behind." This I strongly doubt. I have watched trout in an aquarium repeatedly take minnows, and I asssert that the exact converse is the case. Five times out of six trout take their prey head first, like a perch. I have never seen any signs, on opening a trout, to lead me to imagine for a moment that these fish capture and swallow their prey tail first; on the face of it it seems improbable.

There is a pretty little piece of minnow tackle used on the Windrush, which simply transposes the minnow into a sort of gorge bait. The method of fishing is by sinking and drawing, and one waits ten seconds before striking. It is very effective.

Dead minnows may be preserved for fishing in several ways; how to keep live ones needs no telling. One method of keeping when dead is to salt them. They should be placed in a box pierced with holes, through which the brine may drain, and dry salt sprinkled over them in liberal quantities. They will keep in good order for four or five days. Another way is to pack them pretty tightly in a pickle jar, and pour in spirits of wine; or painting them over with spirits of wine is also a good plan. Either of the two latter dodges toughens the bait. The best-sized minnows are those of about two inches.

On some rivers live-baiting with the minnow is resorted to with great success, and I can assure the reader it is no difficult matter to land a 2lb. trout on a single hook and finest drawn gut as used in this style of fishing. The sight must be sharply exercised in watching the minnow, lest in the spirit of mischief he gets round reeds and other obstructions, to the annoyance of your temper and the breakage of your line. A small round pellet of cork may be used as a sort of indicator of its whereabouts, but it is better dispensed with. Similar tackle to that employed for Thames trout may be used.

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Worm Fishing.

Worm-fishing for trout has undeservedly been much despised. Because it is known to be so deadly after rains, or so sure to take fish from deep pools if practised with a float after the style of gudgeon-fishing, anglers with hypercritical notions about sport denounce it as unsportsmanlike and unworthy the true high-minded angler. There is, of course, a reason to complain if such a charge were true, but worm-fishing in clear water is a totally different style of fishing from this. It is practised in lucid streams, where the trout are few and wary, and never should it be allowed in rivers where the fish are numerous and unused to fishing or anglers. Under circumstances of such difficulty as indicated, it ranks, in my opinion, next to fly-fishing in its demands on the resources of the fisher; the necessity for careful and neat casting and alert attention to the indications of a bite being, indeed, in some respects of a superior grade. Worm-fishing comes in when the water is brightest and the fish wariest, namely, in July or thereabouts. It should never be practised before, and it is really unsportsmanlike, as I have admitted, if used after the showers of late summer begin to colour the water. If the angler is skilled, his sport is sure to be great; if, however, he does not care to attend to the minutiæ of the art of worm-fishing, he may in vain exercise his strength and perseverance, for it is, under such conditions, as difficult to take trout with the worm as with a fly. A good angler in this style, however, may be sure of taking almost as many trout during the heat and brilliance of midsummer as during the whole of his subsequent or previous experience in that season. Mr. Francis goes into raptures over the scenic and other charms, incident to the *dolce far niente* worm-fisher's art. Mr. Stewart confines himself to describing the methods of its practice, and the latter example I shall elect to follow myself. As has been my custom throughout when dealing with all styles of fishing, I will commence with a description of the necessary tackle, and for this purpose let me refer first to the rod.

In order that the cast may be made with a success commensurate with that in fly fishing, I prefer a double-handed rod, of greater stiffness than the ordinary fly rod, and from 14ft. to 16ft. in length. A single-handed rod can, of course, be used if the angler chooses, but I do not recommend it, having found, even in fly fishing, a double-handed weapon inflict less real fatigue than the other. A double-handed rod, then, be it.

When I referred to the success of the cast, I did not mean the getting out of a long line necessarily, but the successful cast of the bait, so that the fragile worm may not be mutilated or broken. A long cast, indeed, is not desirable, because the force of sending it out often sadly disarranges your lure. The length of the rod also aids one in striking and

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bringing home the bait, for it must be patent to everybody that a strike is better made, when the fish is at a distance, with a long rod than a short. An ordinary long roach rod I have found to answer admirably.

The reel may be similar to that used for fly-fishing, and so may the line; the choice of such may be, however, left in some degree to the angler's taste. Personally, I like a hard-dressed eight-plait silk line of Nottingham manufacture and one of Well's spring reels; however, the tyro can use the reel and line of his fly rod if he chooses.

The casting line cannot be too fine. The upper part may, truly, be of thicker gut than the lower, and, like a fly cast, the whole may be taper. I advocate this on two counts: one, the greater facility afforded of getting the line out; the other, the desirability, because of the clearness of the water, when worm-fishing is practised. Drawn gut is better than whole gut, because the former has, by the process of drawing, been deprived of its reflective powers, and is, therefore, not nearly so visible in the water as the latter.

Now, as to hooks. Stewart and Pennell advocate more than one hook —in fact, the former advocates four, tied one above the other. The worm is looped on. It is known as "Stewart's" tackle, and these are the advantages the maker claims for it: (1) That the trout can hardly take hold of the worm at all without having one of the hooks in its mouth; (2) that the worm lives much longer, and, being free to wriggle itself into any shape, is more natural looking, and, consequently, enticing; and, lastly, (3) that it is much more easily baited, especially if the worms are fresh. Very candidly does Mr. Stewart enumerate its disadvantages. He says it is "more difficult to extricate from the fish's mouth [that it is, indeed, especially if the worm be, by chance, swallowed, and the whole four hooks are safely attached]; that it requires to be baited afresh every bite [a nuisance which becomes intolerable when the angler is learning the style, and, in consequence, misses a large number of bites]; and that the exposure of so many hooks is calculated to scare away some of the trout that would otherwise take the bait."

For my part (and Mr. Francis coincides), I think the objections to the tackle far outweigh its usefulness. Another detraction may be added, that is, that the hooks are continually catching in something, whereas the single hook, being unobtrusive and unexposed, does not do so. Besides this, I have found that the worm often breaks itself, no matter how skilfully it is put on or how well it has been scoured. The originator, or, more properly, the adapter, thinks otherwise, of course, and certainly advances strong evidence of the plausibilty of his conviction. He first tried using one and then the four, the trial lasting over three days. The result was that the four hook tackle proved triumphant

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to the extent of about 15 per cent. Such experiments are not, however, unimpeachable as to real test. There are natural conditions of atmosphere and water which are utterly beyond the estimation of the angler, and which will ever render such tests unreliable, unless they are conducted through a long series of days or even months. Perhaps there is something in early training which disposes me to this exclusive liking for the one hook. Anyhow, I prefer it to the quartet Stewart recommends.

For my own part, I prefer a No. 5 or 6 Nottingham hook, that is, the hook used by the tackle makers there almost invariably, whipped on with a bristle or piece of silver wire projecting about a quarter of an inch above the shank. It should be baited by running the hook along the length of the worm, from the mouth to within ¼in. of the tail. In order to do this well it is necessary to have a little silver sand in a receptacle near, or attached to the worm tin, to dip the worm in, that it may not slip between the fingers.

I never attach shot, because I do not believe in impeding the worm at all. If one be fishing in deep water, sinkers are admissible, but then it is not in pools that the angler usually finds his sport. It chiefly is in the midst of streams of shallow water where he will get fish, and to use shot when throwing up-stream is of no utility, beyond producing the properly silent—or nearly so—delivery of the bait.

Besides all this, also, the staying of the bait in the stream is an unnatural proceeding, and is calculated to arouse the suspicions of the wary old fish most likely to regard your bait with favour. Throw in a worm, good angler, and watch it. How it twists and twirls, and then rolls over and over, higgledy-piggledy, amongst the stones and débris of the ground of the stream, and finally into the jaws of a trout. There is ordinarily no stoppage whatever in its progress until it reaches that bourn from which no worm returns—the trout's mouth. Why, then, should the angler place shot on his line? To retard it, say some, so that the fish may have time to take it. Unnatural again! Depend upon it, good trout-fisher, the nearer you in all things approximate to the natural the better your sport.

The worms in use for worm-fishing are chiefly the dew or maiden worm, the red worm, the brandling, and the marsh worm.

The dew or maiden lob, as I have before indicated in the chapter on Barbel, seems a sort of sexless worm of the species *Lumbricus terrestris*, or common earth worm. By well watering the grass of a closely-cut lawn just before sundown, and traversing it afterwards with a lantern, one can always get enough for a day's fishing. They should be kept in damp moss—the sphagnum is the best—that they may scour themselves and become tough and lively.

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There is a black-headed worm, which is probably of another species, called by some anglers the blue head. It is of a sheeny bluish appearance throughout, and is, no doubt, one of the best of worms for trout-fishing when scoured well. There is, however, a difficulty in getting it, and my experience is that very dark stiff loam alone produces it in abundance.

The red worm, or cockspur, is a delightful little fellow, and is found in rotten manure heaps. The brandling is also a pretty worm, but has a remarkably fetid smell. Whilst the red worm is really a splendid lure, the brandling is not often so. Both are too well known to need any description.

The March worm is a great favourite with many anglers, but I do not esteem it as at all approaching the foregoing in popularity with trout. It is of a pale blue colour, with a whitish knot a little above the centre. It is very plentiful, but I do not care much for it. If properly scoured it assumes a bright pink hue, and will kill fish in small waters.

Now, a word as to the storing and keeping of worms in good condition. Get a large box, and into it place old pieces of sacking or any material of that nature without dye, torn into small pieces. Put your worms on the top, and throw in a good lot of earth of the ordinary garden sort. In cold weather place a sack over the receptacle; do so in hot weather also, to keep out the sunshine, which is inimical to the worms. Look them over carefully every few days, throwing away the dead ones.

To scour them, the moss above-named is best; they ought to be in it some three days at least before using. Place them at the top. Walton talks of the yolk of egg as good food for worms, but such fanciful fare is really not worth speaking about. Perhaps, before quitting the subject, the following recipe I discovered in manuscript in the Sloane collection will prove interesting:

"A wonderfull bayte for Trowtes and Thymallos. Draw a black hen, put into the belly of it three yolks of eggs and as much saffron as pease; then sowe up the hole, and bury the hen in a dunghill of hors dung for three or four dayes, till it putrefit or rott, and there will appeare little yellow worms in it. When you have a mind to fish fasten of those wormes to your hooks. Keep the rest of the worms in a pot or vessoll. It is a wonderful experiment." This is taken from a work by John Hooker, the name of which is illegible, and the copyist adds: "I think the like may be made wyth a Herne, for it is said that a Herne hath an attractive power to draw fish to it; and the eggs of Hernes may be better than the yolks of Hen eggs:" He also says, "Wormes sprincled with powder of camphir makes a good bayt for carps, perchs, and other fishes."

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In the selection of a hook bait, those worms that are small and well fed, likewise being somewhat transparent and of good colour—which experience alone will determine—are the best. It must never be supposed that a large worm entices a large trout in the same way as a large bait is found most suitable for a large pike. Such is not the case. I have repeatedly taken 2lb. trout with a worm only just large enough for the hook, but it was always a very lively worm, and well scoured. I do not think trout are very particular what species of worm they take. If there is any preference at all, it is for the cockspur, a small red worm.

The best receptacle for worms for fishing is shown in the latter portion of this work. It is divided into two compartments—one for the worms and the other for the sand. All worms can be got from Walter Wells, Sussex-street, Nottingham, by giving two or three days' notice, and as they are never much more than half a sovereign a thousand, the angler cannot do better than order from him.

Before passing from the bait in worm-fishing, I may say that a capital lure is found in the freshwater shrimp, as described on page 39 in the chapter on Perch. A small roach hook is necessary.

All the objections urged against down-stream fishing with the fly apply to worm-fishing. It is doubtful whether a single fish would be taken on a very bright day if fishing down stream, unless a very long line is used. The difficulty in throwing a long line with a stiff rod has already been adverted to.

In casting the worm a rather different style must be resorted to from that used in fly-throwing. The line must be thrown lightly, so as not to break the worm, and precisely to any given spot. It should, to this end, be allowed to go back to its extremity, and then the plan is to slowly urge it forward, so as to avoid the risk of its popping. If it "pops," of course the chances are the worm requires renewal. Its tail, which hangs loose, is probably broken, and this is a very bad fault in a bait. The vermicular writhings are exceedingly fascinating to trout.

After the bait has fallen on the water, the point of the rod must be lowered, so as to facilitate the sinking of the bait; it should then be slowly raised, so as to keep out of the water as much line as possible, but it is necessary that this should not be done too quickly, lest the trundling, rolling passage of the bait be interfered with. It is of great importance to keep the line as much as possible out of the water, lest the stream, acting upon it, accelerate its force unduly. Also the trout, seeing the continuous line, will very often be startled. In all cases it is best to endeavour to let the worm fall first, as with the fly, because, in the case of an eddy, though it may drop precisely in the centre, yet, if there be much line in the water, it is infallibly swept out of it. There

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is also another reason: the worm is of but little specific gravity (as compared with the water), and floats or rolls down stream at almost the same pace as the stream. On the other hand, the line, if allowed, bags, and a portion of it remains up stream. If this portion be considerable, it retards the strike sufficiently to cause the loss of many a fish. No more than four or five feet of fine gut should be allowed to present itself to the stream, excepting when a deep pool necessitates otherwise. It must be borne in mind that the worm ought not to grovel on the ground, but skip, as it were, over obstacles, and generally behave itself as if it were unencumbered. It then, by force of the stream as much as by the will of the fish, leaps, as it were into the jaws of its foe.

When this consummation so devoutly to be wished has arrived, the first signs are a stoppage. In many cases this is imperceptible to the eye of the uninitiated, but the experienced worm-fisher instantly detects it, and unerringly acts on it by striking. But the striking must not be too rashly done. Lower your rod down stream till the line is straight without bearing on the fish, and strike sharply. This plan may be practised whether you are using the four-hook tackle or the one-hook—perhaps a second or so later for the latter.

Now, no one in the world can determine on paper the precise moment when the strike is most likely to have effect. Let us consider for an instant how a trout takes a worm. I have watched the proceeding often enough in an aquarium. The worm falls and floats down stream wriggling. The trout advances and takes it, if possible, by the tail end; if not by the tail, then by the head, and sometimes quite crosswise. The most general aim of the fish is to take it tail first, this part being best liked. Hence the tail is allowed to hang down in preference to the head.

Somebody may ask how I know the fish like the tail of a worm in preference to the head. By experiment, I answer. I chopped up worms so that the heads and tails were mixed, and distributed them promiscuously to my trout. They invariably "went for" the tails with a decision which, to say the least of it, was remarkable.

From these facts I deduce the desirability of the leading of the worm from head to tail. At the same time one repeatedly finds the fish taking the worm by the head and biting it through—evidently from pure "cussedness"—and then leaving it. In such case Mr. Stewart's tackle has them *instanter*.

It is certainly very deadly in this respect, but I conceive its chief detrimental feature is the habit it has of catching at everything within reach, as if it were really endowed with vitality.

There is another way of catching trout with the worm: Bait a needle tied in the middle (as described in the chapter on Eel Fishing) on the

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finest gut, and let the trout swallow it. A smart jerk fixes the needle transversely, and it is very seldom one is missed.

The caution and circumspection required in fishing pools cannot be too much impressed on the junior angler. Kneel, crouch—do anything, in short, calculated to prevent the fish seeing you. Throw up and outward, and be careful, as the line is about to fall on the water, to raise the top of your rod that it may in some sort arrest the velocity of the falling bait. Do not disturb the water by casting repeatedly into it. Two or three casts will be amply sufficient if you are likely to return to the spot, if not, it may be advisable to try more. Fishing streams is by a similar process. Throw in the same fashion, because, if you throw up and outward, the falling line does not drop exactly on the water in a line with the trout for which you are fishing. The need is not, in the case of streams, to be so particular in keeping out of sight, but, above all things, to be careful to tread as lightly as possible, no matter whether wading or fishing from the bank.

The time of day for worm fishing is, as with fly fishing, early—as early, indeed, as possible in the morning after daybreak. I have often got from 15lb. to 20lb. of fish before eleven o'clock by simply acting upon the principle so oft expressed by the words, "the early bird picks up the worm." Trout are never so ready to feed as when, in the comparative stillness of the summer morning, before the birds are fully astir, and whilst the mist still hangs over the stream, one lets fall the well-scoured worm.

And here it may be well to remark that there seems to be a division of habits amongst trout in this way—one section may be called day fish and the other night fish. I find that usually the smaller fish are to be taken by day, that is, generally from seven or eight o'clock in the morning till the same time at night, and the larger members of the community are found later, and until seven or eight in the following morning. They frequent the shallows, seeking for nocturnal insects, young eels, &c., all night, or may make a peregrination after prey, and in the morning retire to the shelter of some favourite hover to sleep out the hours of intense heat. The early and late angling theory holds good for the largest fish, and experience of results corroborates it. Hence I recommend early rising. The larger fish are probably by no means tired of prospecting for such prey as bury themselves in the gravel or banks during the daytime, therefore the angler has a chance which the habits of the sluggard debar their possessor.

In partial proof of this view, it will often be found that an interval elapses between the feedings of the fish at about the time in the morning indicated. The same observation applies to the evening. An hour or

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still more passes away, and not even one trout is seen searching for food. There may be something in the weather occasioning this, truly, in certain cases, but my experience leads me to the belief that the interval is that between the commencement of the hunt by day, which good trout invariably prosecute, and the retirement of the night hunters. I have had this view strengthened by the behaviour of tame trout which, not long ago, I kept solely for experiment. There was one old stager who always fed at night and laid up all day in his particular drain pipe. The others would feed from my hand, but not he, and yet he was of the *Salmo fario*.

Perhaps there is no rule by which it is possible to prognosticate the likelihood or improbability of sport. Usually the weather is consulted, but with scant result. A water with a breeze on it is always better than that with a dead, silent, opressive calm, under the June sun, rendering every surrounding luminous with reflection and sweltering with heat. Besides, the ripple so disturbs the certainty of the vision of the quick-sighted trout that a much shorter distance may be observed between the fish and his would-be captor, with no disadvantage to the latter. After warm slight showers is a capital time for trout-fishing, especially with the bait under consideration. I like a thoroughly wet day also, but dark, lowering, windy days, with no rain, are really good for any fish, except, perhaps, tench and eels. I know there is an old proverb which runs something like this (I quote from memory):

When the wind blows from the west,
It blows the hook to the fish's nest;
When the wind blows from the south,
It blows the hook to the fish's mouth;
When from the north and east it blows,
Seldom the angler fishing goes.

All of this is, of course, nonsense, and should not influence anyone. I kept a diary of sunsets and sunrises (when I saw them, and that was often), winds and general weathers, for years, and when I sat down to start this book I tried to hammer out some useful lesson for my meteorological jottings. Alas! all hitherto received conclusions were falsified in many cases, and results showed a sublime indifference to atmospherical suggestions. I found good days, with fifteen, twenty, thirty pounds of fish, accompanied by east winds, north winds, south winds, rains, hails, snows, thunder, and other curiosities of Jupiter Pluvius. Dull days brought large fish, bright days, with the fragrant zephyr, &c., little or nothing. That first law of the heavens—order —was absent; and this was my disappointed conclusion—meteorology is all a farce as regards fishing, and weather-wisdom and angling are no more connected than are the moon and green cheese.

Not without much sorrow do I pronounce this conclusion. I know

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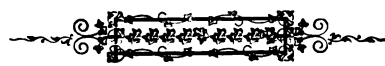
that many estimable anglers hold a contrary opinion, but, as regards fish of prey at least, I must stand steadfast in my belief. The great writers on angling are against me in the majority of cases, but I am simply speaking from conviction. The only writer with whose conclusions I can at all effect a compromise is Mr. Stewart. I give these opinions, but, as the reader will observe, they are very half-hearted, and with no considerable difficulty might be dove-tailed in with my own. This is what he says: "A showery day with occasional sunshine, or an altogether sunny one without a cloud, is most favourable, but an entirely wet day is also very good. Very good sport may be had in calm thundery weather, even with that bugbear 'white clouds' in the sky, as also in blowy, wet weather." You see, whether it be cloudless or not, wet or fine, calm or windy, Mr. Stewart can find sport. I have no doubt of it; and so can I, but not because of any peculiarity of weather.

Fishing in flooded waters with the worm needs but little explanation. All one has to do is to use a leaded line, and either cast down or let the bait roll over and over into the lagoons and nooks amplified or created by the flush of water. A newly dug worm, because of its stronger smell, is recommended instead of a well-scoured one when the water is very thick, and fishing up, for the same reason, is not necessary. This kind of fishing is not to be extolled, as it savours much of poaching. The fish are in such cases heavily handicapped, and not the angler.

I have had very fair success with an artificial worm made of india-rubber. They may be got of almost any tackle maker, and are very durable. Let it not be understood, however, that I recommend them, except in extreme cases, when the live worm cannot be obtained.



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CHAPTER XXVII.

THE THAMES TROUT.

PERHAPS there is no fish existing which requires such persistence and wary skill to snare as the Thames trout. There is no fish in existence to which I have devoted anything like the time and perseverance I have to the one under consideration. Like the younger Herschel—assuredly I gain by the comparison—I was born, so to say, in the midst of the concomitants of my father's craft, which he inherited from his father, and so on for generations further back. He has ever been reckoned one of the best Thames trout fishers on record, and for a professional fisherman has probably brought or been instrumental in bringing more fish to bag than any other man living—Baily, of Nottingham, not excepted. And this simply leads up to the conclusion which I am bold enough to deem inevitable, viz., that I am entitled by the fact of hereditary bias and paternal help and the knowledge of fish capture evidenced by the foregoing pages, to explain what I consider the most rational method of catching the fish in question.

There are three ways which are usually made use of by Thames trout fishers—namely, spinning, live baiting, and fly-fishing. In this order I shall take them. I therefore commence with spinning.

Spinning for Thames trout requires much more art than the corresponding operation for pike. Tackle for the latter is usually employed of a much heavier and rougher nature, the baits are larger, and the rod and line of a more stalwart character. The necessity for *finesse* is also not so great. Pike are not particularly indisposed to take a bait because it falls with a noisy splash; neither, if a pike be hungry, will any, or but few at least, suspicions deter him. Thames trout are very different; their sagacity is marvellous; their fighting power, comprising strength and pluck, is remarkable, and their agility of movement, besides refinement of taste, is very exceptional. Altogether, a graver and more respectable member of the *salmonidæ* does not exist.

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The tackle, therefore, used in spinning should be a light rod, which it is best for the tyro to ask an experienced Thames fisherman to pick out. In all cases it needs must be lighter than a jack rod designed for the same river. In the chapter devoted to tackle I shall pronounce on the most suitable material for rods manufactured for Thames trout. In the meantime, let me only add that it should be so adapted to the user as not to fatigue any one part of the body over much in its use or disproportionately. This seems a slight point, but in reality it is of considerable importance, when one is bent on getting as much pleasure out of the gentle craft as possible. Of the reel, personally I can safely say that I prefer the Nottingham spring, made by Wells of that town, for the reason that I always throw off the reel as described in the chapter on Pike. There are many excellent fishermen on the Thames, who, being conservative in the best sense of that misused word, prefer the check or click winch. This has been before described, and I need not further dilate upon it beyond premising that a dressed line is requisite, as it is thrown in the coil fashion from the punt's well, bottom, or till board.

Now, as to the throw or cast. This may be made as for pike, but it should be a refinement on that if possible. The tiny bait ought to fall with the lightest of splashes on the water, and not as if the object were to break the skull of some devoted fish.

The trace next claims our attention. It should be of the best silkworm gut, and so tied and generally made as to exhibit uniformity in the length of gut, distance of swivels, and taper, for it ought to taper from its upper to the lowermost parts. 4ft. is quite long enough, and the swivels should be double and of the smallest, *made of brass*. This selection of metal is good because there is no rusting and consequent kinking with it as there often is found to exist in the case of the ordinary japanned steel. The brass may be oxidised or painted a dull green, the latter is the better plan. The swivels should be interspersed at a distance of 9in. for 3ft., commencing at the line end. A loop at each end completes the trace with the exception of the lead.

It will be observed by the angler who has used the ordinary lead attached rigidly to the trace, that I have given no directions for its attachment. I have omitted this advisedly. The "Keene" lead figured later on is capable of attachment at any part of the trace—a boon hitherto unattainable. The advantage of this arrangement is, that no matter in what depth of water one is spinning for Thames trout (and in fishing down from one station to others all sorts of depths are encountered), the weight can always be raised or lowered as the angler lowers or raises his roach float. He is, therefore, under little necessity to alter his pace of spinning, and, the slower this is, be it said, compatible with a

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correct "spin," the better for the chance of capture. I never use any other if I can help it, and having tested its value in a hundred different ways, I am prepared to vouch for it, notwithstanding the seeming egotism of so doing.

The most suitable flight, in my opinion, has yet to be devised. I do not like Mr. Pennell's flight, because of the loose hook, and because I really have missed so many fish, in spite of this flying triangle. The old Thomas flight of nine well tempered triangles, and my style of lip-hook, are the nearest to perfection I know of; and if a real Thames fisherman is allowed to put on the 4in. bleak or dace, I ask for no more elegant spin. I admit his arguments against a number of triangles in the case of pike, but, in reference to the comparatively soft mouth of the Thames trout, they do not exhibit force, and I, as well from experience as theory, beg to differ.

So much for spinning. Let us now go into the case of live-baiting. Mighty and fierce have been the battles fought of yore in the piscatorial literature of the day about the sportsmanlike or unsportsmanlike character of this form of fishing. I frankly state I am a partisan whose opinions have been frequently mauled in this matter by the princes of piscatorial rhetoric. I will try, however, to weigh the pros and cons fairly. First, however, what sort of tackle is used? I always use a single No. 2 hook, which is attached to an unweighted trace of often *drawn* gut. This is in turn attached to a thin Nottingham line, no thicker than sewing silk, and a reel which likewise in turn is attached to a Nottingham deal and lance rod. My rod is light enough for fly-fishing. Here we have apparatus of an exceeding fragile character, giving the greatest possible chance to the fish, and handicapping the angler more heavily than in any other kind of fishing. Yet, forsooth, it has been denounced by those who cannot use it as of a poaching nature.

This is how it is used. Thames trout feed ordinarily at intervals, which are calculable. Thus, although I do not aver they do not break the rule, usually, if a fish is seen feeding at seven o'clock at night, he will feed on the next evening at almost the same time; similarly at morning or any other time of the day. This being so, the live baiter, having ascertained the usual time of feeding, anchors his punt above the spot where *S. fairo* is wont to rise, at a distance of nearly twenty yards —perhaps more, according to the exigencies of stream and other considerations impossible of enumeration here. He lets out the bait to which he pays the line until it is perhaps half a dozen yards *below* the said noted rising place. Presently the trout feeds, and piscator instantly reels up the bait till the *exact* spot is reached, and waits. The next time the trout takes a bait it probably takes the one which is attached to the

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hook, and then the question becomes one of Man *v.* Trout. Very often the trout wins, where it would not be the case if a spinning tackle were in use, and very often he does not; but in no case can it be said that the fish is "skull-dragged," as is undeniably the case with the ordinary gorge live bait tackle.

The working of both the spinning bait and this in the boiling water of the weir requires much ambidextrous skill, but of the two the manipulation of the latter is the more difficult, and is, perhaps, commensurately more successful in the "rising," if not the actual capture, of the fish.

Fly fishing for Thames trout is by no means so much in favour with Thames anglers as the two preceding methods, and I must confess that the throwing of a grilse fly—which is that most in use—continually, day after day, perhaps for a week, without a rise, is at least disheartening. Yet this is the constant experience of such a use. Nevertheless, occasionally the end crowns the work, and a fine ten-pounder comes to bag, having given all the glorious pleasure in its resistance, of which a fly rod is perhaps the truest magnifier. Several well-known anglers of late years have reported favourably of this style, and it therefore may be admitted in the list of methods.

Natural fly fishing for Thames trout is really nice work, requiring a lot of patience and skill, and very sharp eyesight. Very few practise it, however, though I am persuaded that it would pay if tried with the stone fly, or the drakes, or other large fly. The particulars of the method have already been described, and are, therefore, identical with that for the ordinary brook trout. I have used a cockchafer or beetle for Thames trout, and once took one of 4½lb. with a spider. When quite a child, I captured my first Thames trout, from Chertsey waters, by using a cockroach, nasty as the bait was to handle.

And well do I remember the capture of that first Thames trout. Many a morning had I watched from behind the gnarled old willow whose roots concealed his home, and peered over into the silent smiling lucid depths till I beheld the smooth brown head and great lustrous eyes, which, as he lay poised and still, seemed to gaze, like the eyes of a man in a trance, at something far beyond his immediate ken. Ordinarily, the brown trout of our brooks keeps up an incessant, though almost imperceptible, movement of these organs, probably for the purpose of examining each tiniest of insects borne on the current lest one particle of food pass by unheeded. With the fish to which I now refer, however, no movement of the eyes was apparent, and, save that the expanding gills gave notice of life, one would have aptly compared its stillness and immobility to the quiet of death. No; the full orbed brilliance of this 10lb. fish's eyes was a quiet absorbed sheen, which clearly demonstrated the calm of this patrician's

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spirit. Somebody says that the true gentleman may be known because he is ever "calm eyed." So with this trout, his high-born glory of development culminated in the question of his organs of sight.

By carefully craning my neck so that the shadow of my head did not fall on the water, I could sometimes see the whole of his imposing presence. What a splendid fellow he was to be sure! The clear washed silver of his sides, shot with a carmine of exquisite richness, and the leopard-like markings of his back, how beautifully harmonised! The most adroit efforts of the greatest painters have never equalled in grace and beauty the symmetry of the most simple of our fishes. There is such a completeness in the adaptation of the means to its end; such an evidence of delicacy and vigorous strength, and withal such an aureole of beauty in colour and brightness, that representations even of ideal beauty have never, so far as my observation has gone, equalled the actual figure of a trout, and, when that trout is a Thames fish to boot, my convictions are remarkably enhanced.

Thus, morning after morning, I gazed my fill, and gloated over the charms of the unconscious fish till, lover like, I could no longer refrain from endeavouring to possess myself of the splendid fellow. But what a shame it would sometimes seem, when I even had put my rod together, and, strange as it may appear, I assure my readers that more than once I refrained from wetting a line in consequence of this reflection. But at last I could stay my hand no longer. Every morning at six, to a tick, would the grand fellow plunge from his lair, and speeding to the mid-stream where a plashing rapid gurgled and rushed over the whitened stones, he would single out the little "willow blade," or bleak, or vivacious minnow, and a resonant roll would accompany the strong effort of capture, announcing the death of its prey at the same time. Never but once did I observe him miss, and then he sulked for half-an-hour, returning disappointed and disgusted to his home. His sight and spring were unerring, and from six till nearly eight were frequent for at least a month before the dire intention to capture him entered my heart. I know not why I refrained, but, as a matter of fact, I did.

He must die! The fiat, like the stern movement of the thumb in the Roman arena, had gone forth, and, as against the Medo-Persian laws, there was no appeal. At a quarter to six, therefore, one bright sunshiny July morning, I stepped into the punt, and was soon within twenty yards of the happy hunting grounds of the fish. The Nottingham live bait tackle was to be the means of his destruction, and forthwith the line was prepared, and down stream floated the agile bleak to a little below where his troutship usually struck. Presently there was a roll of the water, and I made certain he had taken the bait and struck. By Jove he

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had, too, and had been too clever for me, for he carried it away, but not before I managed to prick him. Oh, evil luck! oh, cursed mishap!

There was nothing for it but to desist that morning. Like all high-bred creatures, the perceptions of a Thames trout are keenly sensitive, and I had taught him a lesson not to be easily forgotten. The prick of the hook did it. I never saw him feed again but once, and that was his last attempt.

In vain after this did I attempt to claim my coy trout by every method I could devise. Spinning, trolling, and the worm, I am sorry to say, were tried, and each one proved unavailing, notwithstanding the most intense perseverance. The fish still came home to "roost," for I could, as of old, just see his majestic form in the covert it had chosen for a home. But when it fed I knew not. I noticed, however, a sort of restlessness in its habits. From being a perfectly stationary hermit it shifted its position occasionally, sometimes so far ahead as to be accessible from above stream.

One day a thought struck me, and, midday as it was, I set about putting it in practice. Our house contained black beetles, or, more properly, cockroaches, galore; and, when the cat was not occupied in chasing and eating them, they were usually taken in hand by myself and poisoned. It is not generally known, but the common fern is a first-rate poison for them. They eat it greedily, and so passionately fond of it are they that if a brother cockroach arrives on the scene too late by reason of it having been eaten, he will occasionally set about devouring his *confrères* who are perchance dead or dying from its effects. The night previous I had vented my hatred of them as indicated, and the result had been nearly a pint of cockroaches, dead and dying. Now, cockroaches are caviare to trout of the brook, why not of the river Thames?

No sooner the thought, than the rod is put together. The finest gut bottom is attached, a No. 7 hook thereto spliced, and a cockroach lightly impaled. By standing on the crown of a willow, some 15yds. off, I could see the head of my quarry, though he could scarcely see me by reason of the natural exigencies of the laws governing refraction and reflection. Very quietly I let my bait down on the water, and paid out the fine line to within 3ft. or 4ft. of the nose of the trout. Now had arrived the time for finessing; with the utmost circumspection, with a slow, fluent, gliding motion, the cockroach was lowered on—on—on—till within a few inches of the fish's mouth. Then I withdrew it, as if to take it entirely from the water. No notice took he. My heart again failed me, well nigh at least, for I had tried by this time persistently for some weeks to capture this lordly fish, and as each failure was added to its predecessor my desire of possession naturally grew greater and greater. However, I very, very gently

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moved up a few yards, and again watched the bait down towards the stolid fish. This time the cockroach had sunk deeper in the water, and, with a sort of chuckle, I watched it gradually approach his muzzle in the same plane, and not as before, rather above. As it neared him, to my inexpressible joy, I saw his under lip show as if it had, by some mechanical impulse connected with the bait, automatically moved. Nearer passed the bait onwards, the jaw lowered yet, and, like a child taking a sop, like an unfledged bird taking in a worm, it passed behind the portals of that polished head. With suppressed breath and palpitating heart I counted—one, two, three, four, five—then, with a side movement, I struck; not violently, but swiftly; not mightily, but strongly. Ye gods, he was hooked, and out yards in the stream he sped!

Of course he was only landed after the usual interregnum of splendid struggling, and I became the hero of the hour in the possession of this splendid fish.

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CHAPTER XXVIII.

THE GREAT LAKE TROUT.

HAVING thus dealt with the common *Salmo fario* of our streams and rivers, it now becomes my task to revert to the history of the great lake trout, which is the second of the generally recognised three species of yellow trouts in England. The first of these is the *S. fario*, and the third the Loch Leven trout (*S. levenensis*).

The flesh of the great lake trout (*S. ferox*) is commonly of an orange yellow, and the exceedingly disproportionate length of its head—about one-fourth of the length of the fish—as well as the squareness of its tail, clearly distinguish it from the *S. levenensis* and the *S. fairo*. If these distinctions be borne in mind, the fish will be readily recognised and never confounded with the foregoing *S. fairo*.

These fish often grow to great size. The Earl of Enniskillin informed Couch of a 28lb. fish from Lough Eck, and I have heard of one of 31lb. from Loch Awe. The ordinary size runs to 12lb. or 15lb., however.

The fish was known in Sweden, as Nillson mentions. It is chiefly found in Loch Awe and throughout the deeper and larger lochs of the country. Ireland produces them, and specimens have been taken from Malham Tarn, in Yorkshire. It is also found in Llyn-y-Bugail, in Montgomeryshire. According to the "Angler Naturalist," it is the *Ullswater* trout, and the grey trout of the lake districts; but, although it has been supposed identical with the great trout of the Lake of Geneva, Agassiz has determined that it is not so, there being strongly pronounced differences between the two species.

The name *ferox* sufficiently denotes the nature of this member of the *salmonidæ* family. Its nature is, indeed, fierce and unrelenting, bold and voracious. It is said in exemplification of this, that it will, after having taken a bait, allow itself to be dragged 40yds. or 50yds. behind the boat before leaving go, even if not hooked; and should it then do so it will

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often immediately seize the bait again. Its immense bulk is of aldermanic proportions, and it is an exceedingly good feeder. I have found on several occasions on opening a fish that its stomach was packed with food. It seldom roams far up or down the stream leading to or from the lock it may have made its home, but with a fierceness and solitariness it prowls singly, seeking what it may devour. It spawns in September, or thereabouts, and at that time leaves the deeper water and penetrates a little distance up stream returning very shortly, not, like the salmon, making extensive journeys.

The differences between the sexes is very marked, and in consequence it is not a very hard task to determine the male or female. The teeth are considerably stronger in the male, the distance from eye to snout greater, and the configuration of the opercula is different, those of the female resembling the roundness of the salmon. In some instances the spot markings of the male have a pale circle of dull orange round them.

The following characteristics of a trout weighing 15lb. are given by Couch: "The length 2ft. 4½in., the body stout and thick, carrying its breadth and thickness back to the adipose fin. Head large, flat at the top, snout projecting before the eyes, ending blunt. Jaws equal, gape large, mystache considerably behind the eye. Teeth strong and sharp, the points directed inwards, distant from each other, those on the mystache continued through the whole length with an interruption in front of the upper jaw; strong recurved teeth round the palate, a single row along the vomer, and a strong row across the front of the vomerine row, but distinct from it, also appearing distinct from the side row of the palate. Strong incurved teeth in the lower jaw, and within, on each side near the front, a separate row. Tongue fleshy, with a double row of not very large teeth. Being a male, there was the kipper or turned-up process in front of the lower jaw, but not so high as in the salmon, and it was received into a cavity in the upper jaw. Nostrils above the level of the line from eye to snout; scales on the body round, those along the lateral line shining; origin of the dorsal fin 1ft. 1in. from the snout; adipose fin large, and not far from the tail; its upper part was widest. Width of tail 8in., and at its root 3¼in.; the border might be called straight, except that there is a small point at the corner above and below; pectorals rather wide, the upper rays curved. The colour along the back and upper part of the sides dark tinted with blue, as are also the dorsal fin and tail; cheeks yellow, covered, as is the body, with round dots, rare on the belly; pectoral and central fins yellowish and dark; a tinge of purple on the sides, where the scales shine as if pearly. Fin rays: Dorsal 12; anal 10; pectoral 13; caudal 20."

The specimen from Yorkshire (Malbarn Tarn) presented rather

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different characteristics. Its muscularity of build was by no means so pronounced. Its tail was broader and more rounded; the dorsal and anal fins were more developed, and the adipose fin was reddish, a corresponding warmth of tinge spreading over the entire body.

Fishing for this fish is best done at night time. Spinning seems to be the tackle most likely to ensure good sport. The fan tail is a capital lure, and should be spun about 30yds. from the boat, as near the bottom as possible. The boat is best rowed slowly, as the fish will not trouble to follow. The depth ought not to be more than from 15ft. to 40ft. in which to fish.

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CHAPTER XXIX.

THE LOCH LEVEN TROUT.

IT might have been supposed, from a cursory view of the *salmonidæ* family, that this trout is but a variation of the common *fario*, born and bred under different circumstances of habitat, and thus acquiring different characteristics, albeit of not sufficient importance to warrant it in occupying a distinct cognomenation. The idea has been negatived by Dr. Parnell, Dr. Corsell, and Sir John Richardson, their conclusions being based on irrefragible evidences, not the least amongst which is the fact that there is a considerable difference in the number of the cæca, or appendages at the beginning of the bowels, between this fish and the common trout. In *S. fario* there are forty-six, in this fish as many as from sixty to eighty, hence its specific name, *Salmo cæcifer*, a cæca bearer. There are other important differences between this and the other trouts. For example, the Loch Leven trout has never any crimson spots on the body, whilst the common trout is never without them, and the flesh of the fish is a deep red. That of the *S. fario* is either pink or white, and that of the *S. ferox* is orange yellow. The Loch Leven trout takes its name, as may be remembered, from the now ruined lake and dismantled castle wherein the unfortunate Mary Stuart was imprisoned. Of late years the quality of the fish has deteriorated, owing to some cause or other, and their number greatly reduced.

The following detailed description is from that of Dr. Powell, of a fish one foot in length: "Head a little more than one-fifth of the whole length, tail fin included. Depth of body at deepest part about equal to length of head. Gill cover produced behind, lower margin of operculum oblique, præoperculum rounded. Commencement of back from half-way between point of upper jaw and a point a little beyond the fleshy portion of the tail. End of back fin even, sometimes concave. Pectoral fins pointed when expanded, in common trout rounded. Tail fin long, rather

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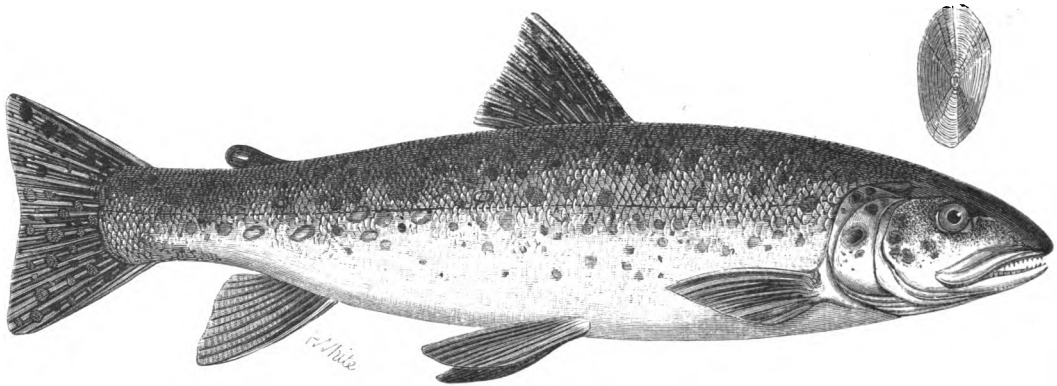

LOCH LEVEN TROUT (*Trutta Levenensis*).

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narrow, and concave at end. Tail fin rays much longer than in the common trout, and pointed at the upper and lower extremities, whilst in the latter they are rounded. Teeth stout, sharp, and curved slightly inwards, situated as in common trout. Scales small, thick, and adherent, and, when dry, exhibiting a small ridge in the centre of each, not perceived in the common trout, viz., in an oblique line between the middle back fin, say to lateral line. Colours: Back, deep olive green; sides, lighter; belly, inclining to yellow; pectoral fins, orange tipped with grey; back and tail fins, dusky; ventral and anal fins lighter.

The method of capture is similar to that applied in reference to the Great Lake Trout of the foregoing chapter.

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CHAPTER XXX.

THE CHARRS.

I HEAD this chapter as above, because some preliminary observations are necessary in order to inform the general reader of the present state of knowledge in connection with the fish called charr. A great deal of obscurity hangs over this member of the great *Salmonidæ* family (Milton has chosen to render it a subsidiary, terming the charr of *salvelini* not *salmo*), and, as a result, every ichthyological authority has more or less differed from his predecessors or contemporaries. A fish of this name has been mentioned by Willoughby, and he, regarding the differences which appeared in the specimens under his observation, divided the charrs into two species—viz., the red-bellied charr and the gilt charr. Ray, a most learned writer, in his "Synopsis Piscium" remarks in the "Itinerary," anent one of these fishes: "At Llanberis, Bettew, Festiniog, there is a fish taken called Torgoch, blackish upon the back, red under the belly—from which it obtains its name—and of which they tell some fabulous stories: as that three sons of the Church brought them from Rome and put them into three lakes—to wit, Llanberis, Llynumber, and Trevennyn, into each two. They were taken in each lake, but only at one time of the year, and at a different time in the several lakes. At Llanberis they say they are only taken in the night, and that when it is not moonlight." This latter circumstance, Couch adds, "might have caused a doubt whether the fish of that lake might not be a different species from some of the others, as, indeed, has since been shown to be the case, although it may be remarked that more than one species may inhabit the same piece of water, and then, of course, the actions of each may be supposed to vary as concerns the time of their appearance and capture."

It appears to be certain that the gilt charr is only a barren individual of the species. The gilt charr is indubitably but another name for the same fish, and the supposition that the name is derived from a golden tint is erroneous. No such tint has ever been noticed.

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Pennant does not acknowledge any difference between the various charrs of which he was cognisant, notwithstanding careful examination. Fleming, however, describes two distinct species—one that he calls the *Salmo salvelinus* and *S. alpinus*; but he thus very pertinently remarks on the incompetency of the knowledge of charr: "Though the observations of Donovan have advanced considerably the history of the species, there is yet wanting more complete elucidation of their character and manners." There can be no doubt that there is a very considerable resemblance between the charrs of various waters; and this idea is corroborated by the fluctuations observable in the writings of the naturalists, who ought, above all, to be clear and unwavering in their pronunciation. Mr. Yarrell, for example, was at first indeed inclined to favour Dr. Fleming; but I perceive a distinct alteration of opinion in his book as now published. Couch naïvely refers to the state of the fishery laws in 1861, which, he says, do not acknowledge the possibility of there being more than a single species of this fish in the United Kingdom; and this, according to the Commissioners, is to be found only in the lake district of Cumberland and Westmoreland, where the spawning season extends from October to March. "Acting on this theory," he observes, "and connecting it with views of the salmon fishery, they are thus led to recommend that it shall be forbidden to take charrs after the beginning of September, which is, in fact, to render it unlawful to catch them at the only season when the fishery can be conducted with profit."

It appears, however, that Dr. Günther varied this idea by clearly demonstrating the existence of no less than five distinct species of charr, and these, for the most part, distinct from their supposed "doubles" on the Continent. As Dr. Günther's communication to the Zoological Society was without question *pro bono publico*, I, with every apology to that great ichthyologist, beg to present my readers with a *précis* of his researches, which, it may be added, without doubt put at rest for ever the uncertainties formerly surrounding this great family of the *Salmonidæ*, if, indeed, its character merits that distinction.

Linnæus denominated the three species of which he was aware: *Salmo umbla*, *Salmo salvelinus*, and *Salmo alpinus*, and before I (he says) enter into a detailed description of the three species on which it is only necessary for me here to dilate, perhaps a brief consideration of what fishes Linnæus referred to is necessary. First, then, let me refer to:—

Salmo salvelinus, of South Germany.—Linnæus has founded this species on the tenth species of *Salmo* in Artedi's "Genera," or on the eleventh of his "Synonymy," and Artedi had derived the whole of his knowledge of the fish from Willoughby, who gives a description of the

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salvelin from a specimen captured near the Austrian town of Linz. Therefore, there cannot be the slightest doubt that the Linnean denomination is intended for the South German fish, which, up to the present day, is called Sälbling at various localities.

Salmo umbla.—Linnæus has founded this species on the ninth species of *salmo* in Artedi's "Genera," or on the seventh in his "Synonymy," the latter ichthyologist following Rondolet, who described the *Salmo lemani lacus, seu umbla*, as the *Ombre* (chevalier) of the Lakes of Geneva and Neuchatel. Jenyns and Agassiz have given figures of this fish. Far superior to these is that published by Rapp, who has identified the Röthel of the Lake of Constance with the *Salmo umbla*, L.

This species never assumes the red colours of the *S. salvelinus*, or of the charrs of Windermere or of Wales. It could be compared in this respect only with the "fresh-water herring" of Lough Melvin, from which it is readily distinguished by its much larger teeth, by its wide mouth, the maxillary extending to behind the orbit, by its much more elongated body, and by the proportions of its fins. *Salmo umbla* of Linné differs from the British charrs in nearly every one of the external characters, and agrees with the Irish species only in its plainer coloration and in the size of its scales.

Salmo alpinus.—Linnæus, on his tour through Lapland, discovered in the mountain lakes of that country a species of charr which he described in the "Fauna Lapponica," p. 117, No. 310, and which he named *S. alpinus* in the "Systema Naturæ." He adopts the opinion of Artedi in referring to the British charr (which he knew from Willoughby's description) as a synonym to this *S. alpinus*. Even the few details which are given in his and Nilsson's descriptions do not admit of an identification of those species. Linné says that the length of the head of the typical specimen was ¼in., and the distance from (the front margin of) the dorsal to the adipose fin 3in. In the British charr the head is much longer. He found the length of the head equal to that of the base of the dorsal fin; in British charrs the base of that fin is much shorter. Nilsson describes the *S. alpinus* (L.) as a distinct variety of *S. salvelinus*, distinguished by short fins, but *S. salvelinus* (Nilsson) has shorter fins than any of the British charrs.

We are, therefore, not justified in admitting one of those Linnean denominations for the British species, which will be described in this chapter. This view being in contradiction with that of all former writers, I think it necessary to give an *historical review* of what has been done on the subject.

In 1685 Willoughby was the first who, with the practised eye of an ichthyologist, examined the charrs of England and Wales, devoting a

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separate article to their description. He recognises their affinity to the Sälbling (*S. salvelinus*), and lets the description of the German and British fishes follow one another; but the "torgoch" of Wales and the "red charre of Winander-mere" appear to him to be the same species, with which he unites even the "*Reutell* or Röthel of South Germany"—a fish which, however, appears to have been known to him rather by name or by recollection than by actual examination and by comparison with the British fish.

Willoughby mentions the *Gilt charr* beside the red charr, also from the lakes of Westmoreland, considering it identical with *Salvianis carpione*, from the Lago di Garda. In the description of the latter he says (p. 197), "*In palato quinque dentium ariolæ.*" Whilst he expressly and correctly mentions that the middle of the palate is toothless in the Sälbling as well as in the red charr. Therefore, the gilt charr, as it is understood by Willoughby, cannot be a true charr without teeth along the middle of the vomer (*Salmo sensu stricto*); but it is a species of *salar* or *fario*, with five series of teeth along the roof of the mouth, viz., two along the maxillaries, two along the palatines, and one along the vomer.

We shall see that Pennant and Yarrell mention the gilt charr as a variety of the common charr; but what Pennant says about its habits and propagation tends to show that Willoughby was perfectly right in referring to it as a very different species.

In the year 1738 the confusion commences with Artedi and Linnæus, who, without knowing the British fish, refer Willoughby's "red charr" to the *Salmo alpinus* from Lapland.

In 1755, Farrington, in a letter printed in the "Philosophical Transactions" of this year, gives some notes about the general appearance and the habits of the torgoch. He very truly remarks that the fish is "slimy, nearly allied to the eel and the tench," and that "the male is not adorned with the beautiful red hue of the female;" "yet," he continues, "he is finely shaded and marbled upon the back and sides with black streaks." "The turgoch makes its appearance at the shores of the Llanberis lakes about the winter solstice; the whole number annually taken in the two pools of Llanberis does not amount to a hundred dozen."

In 1776, Pennant knows that the charr not only occurs in England and Wales, but also in Scotland, whilst he has not received any evidence of its existence in Ireland. He first mentions the fact, which is repeated in all other works, that the charrs of the Lake of Llanberis were entirely destroyed by noxious waters flowing from copper-mines in the neighbourhood. Dr. Günther says:—"This fact is doubted by Mr. S. P.W.

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Ellis, who writes in answer to an inquiry on the subject: 'Llanberis Lake is three and a quarter or four miles long; the width varies, the greatest width being about three-fourths of a mile; the greatest depth is said to be forty fathoms. The quantity of water coming from copper works is not more than one-tenth part of the whole volume, and this portion flows about five miles before falling into the lake, and, besides, passes through a mountain lake after having left the mine. Below this mountain pool the water is not poisonous to fish. The quantity of water from copper-mines has decreased in this valley owing to the stoppage of works. I cannot think there were ever mines worked to any such extent as to seriously injure fishes. The chief works are slate quarries. J. Petherick, Esq., who has a thorough knowledge of these mines, a part of which are worked by himself, is also of the same opinion.'"

Pennant has examined the red charr and the gilt charr, but considers both as the same species, although the former spawns about Michaelmas, ascending the river Brathay, whilst the spawning season of the latter extends from the month of January to that of March, the fish remaining in the sandy parts of the lake.

In 1802, the knowledge of these fishes was considerably advanced by Donovan, who well perceived the difference between the torgoch and the charr, but is unable to fix the distinctive characters in specific terms existing for the purpose of diagnosis to the differences in colour, which in his figures are much exaggerated and untrue. In his description he is quite right in directing attention to the slender form of the torgoch, and he might have added another important character which is indicated in the figures, namely, that whilst in the charr the root of the pectoral is quite free and not overlapped by a prolonged sub-operculum (or lesser gill cover), the latter is produced backwards and inwards in the torgoch. The physiognomy of the fishes has lost much by representing the eye too small, whilst the differences in the structure of the nostrils apparently has been noticed by him. He employs for the charr the Linnean name of *S. alpinus*, and for the torgoch that of *S. salvelinus*.

Luton, in 1807, follows Donovan, and evidently has examined the torgoch, as he gives the correct number of the dorsal rays, viz., thirteen. The statements of the different authors, especially of the earlier, with regard to the fin rays, can only be met with great caution, first, because they had only partly recognised the value of that feature, and secondly, because they counted them in different ways, frequently omitting the small rays in front of the fins.

In 1813 the first definite notice of the occurrence of a charr-like fish appears to be by Dubourdieu, who, in his history of the county of Antrim, in a list of the fishes of Lough Neagh, enumerates the whiting,

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which, by a friend of the author, Mr. Templeton, is declared to be the *S. alpinus*. As the description does not give any specific character, we are left in doubt about the correctness of the determination. It is probable that the whiting of Lough Neagh is now extinct.

Thompson says that, when visiting Lough Neagh in 1843, he was assured by the fishermen that they had not known of any of these whiting being taken from the lake for at least ten years previously. This is confirmed by Mr. Patterson, of Belfast, in a letter addressed to Dr. Günther, in which he states that the "Charr is believed to have been extinct in that lake for more than thirty years." Therefore, the question whether the whiting of Lough Neagh was identical with one of the other species, or whether it was a distinct species, will remain unsolved.

In 1834, Agassiz, being engaged in the examination of some of the continental *salmonidæ*, and having compared them with those of Great Britain, declared at the meeting of the British Association of that year that the charrs of England and Ireland, the ombre chevalier of the Lake of Geneva, and all the different charr-like fishes of Sweden, Switzerland, and all the southern parts of Germany, were one and the same species, or, in other words, that the *S. umbla*, *S. salvelinus*, *S. alpinus*, and *S. salmonica*, were merely synonymous; but Dr. Günther says he cannot "arrive at the same conclusion as Agassiz with regard to the British charrs known to me."

By the colours alone fresh specimens of *S. salvelinus*, *S. umbla*, and *S. Willoughbii*, may be always distinguished.

Jenyns, in 1835, adopts only a part of the views advocated by Agassiz, distinguishing *S. umbla* and *S. salvelinus*. With regard to the former, whence the specimens were obtained is not stated. Mr. Jenyns describes his second species as the torgoch, and calls it *S. salvelinus*.

The view of Agassiz was eventually supported by the late Mr. W. Thompson, of Belfast, who, having had an opportunity of examining the charrs of Windermere, Loch Greenock, Lough Melvin, and of nine other lakes in Scotland and Ireland, came to the conclusion that they were but one species—one, however, that is subject to extraordinary variety; but Mr. Thompson has not brought forward any other proof of this assertion that the differences presented by the charr from various localities are very manifold. The following appeared to him to be the most striking differences:

(1) In specimens from Loch Greenock the male fish has the colour of *S. salvelinus* (Donovan), the female those of *S. alpinus* (Donovan). The male has a much larger head and larger fins than the female. Number of ova, 500.

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(2) In specimens from Loch Menin both sexes are coloured alike, nor can they be distinguished from each other by the size of the fins.

The difference observed in the charrs from other localities is not pointed out. Dr. Günther considered Mr. Thompson's paper as highly important to our knowledge of the geographical distribution of the charrs in Great Britain.

(1) A charr is found in Loch Greenock, Kirkcudbrightshire, which makes its appearance only during ten days, never before about the 13th of October. The sexes are distinct from each other in colour and in the size of the head and the fins. Of the vertebræ the male has sixty, the female sixty-two or sixty-three. Besides a detailed description of the colours, the account does not contain anything from which we could determine the species.

(2) Of other localities in Scotland Loch Inch and Loch Con are mentioned. They appear to be inhabited by a species identical with or similar to *S. Willoughbii*—at all events, by one very different from the "Hoddy" of Loch Kullin, in Inverness-shire. The latter is very interesting, inasmuch as it appears to be allied closely to the freshwater herring of Lough Melvin. They are only caught when spawning, about the 20th September.

(3) The freshwater herring of Lough Melvin appears to be confined to that locality.

(4) Lough Dan, county Wicklow, Ireland, inhabited by a charr "presenting some of the characteristics both of the northern and Welsh charr." Specimens caught in summer with the fly.

(5) Other localities in Ireland are L. Kindun, L. Garten, L. Derg, Lake of Luggela, Lough Nobruk, and L. Corrib.

The charrs from these localities had a deep red belly, and appear to approach *S. Willoughbii* or *S. Cambricus*.

(6) The following localities in Ireland are named on the authority of other writers: L. Esk (co. Donegal); Cummeloughs, in the mountains of Cummeragh; Lake of Inchbegreelah (co. Cork), and one or two other small lakes in the neighbourhood; L. Neagh, a lake near Danfanaghty (co. Donegal); L. Eaghish (co. Monaghan).

In 1841 Yarrell distinguished, according to Donovan, *S. umbla* and *S. salvelinus*, adopting, in subsequent editions of his work, the opinions of Agassiz and Thompson. His account is composed of the observations of the different writers mentioned. New localities are referred to Keswick, Cummock Water, Coniston Water, Loch of Moy, and Loch Inch.

Having thus, with gratitude, made such use of Dr. Günther's elaborate treatise, I beg leave to further lay him under contribution in a technical description of the three recognised species. I do this with the less hesi-

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tation because far greater authorities (with but scant acknowledgment, be it said) have done the same. Couch and Pennell have extracted from the magnificent paper of Günther's, and I, albeit with more modesty and thanks, do the same.

Willoughby's charr (*Salmo Willoughbii*), the charr of Windermere, is thus described (I condense the description): Body compressed, slightly elevated; length of the head, a little more than half of the distance of the snout and the orbital from the origin of the dorsal fin; head compressed, inter-orbital space convex, its width being less than twice the diameter of the eye. Jaws of equal length anteriorly; teeth of moderate strength, four in each inter-maxillary, twenty in the maxillary. Length of the pectoral fin, less than that of the head, much more than half between its root and that of the ventral; nostrils immediately before the eye. The maxillary bone (mystache) extends scarcely beyond the hindmost margin of the eye; two pairs of teeth on the vomer, four pairs on the tongue. The bones of the gill membrane are said not to be equal in all cases on each side. The origin of the dorsal fin is exactly in the middle, between the snout and the root of the caudal; the rays twelve in number, the first very short, fourth and fifth longest. Anal fin with twelve rays, its origin exactly in the middle, between the root of the caudal and that of the outer ventral ray, the first ray very small, the five first rays obscured by being inclosed in a common membrane, the fourth longest, fifth banded. Tail fin forked, the lobes pointed; pectoral fin at its root not overlapped by the gill covers, the rays thirteen or fourteen, ventral nine or ten, situated below the last two rays of the dorsal. Scales thin and small. Colour on sides of the back dark sea green, blackish on the back and on the greater part of the dorsal and caudal fins. Sides with slight silvery shade, passing into a beautiful deep red on the belly; pectorals greenish, passing into reddish posteriorly, the upper border white; ventral fins red, with a white outer margin and a blackish shade within the margin and reddish with a blackish shade over the whole of the middle, and with a white anterior margin; sides of the head silvery, the lower parts minutely dotted with black. Number of the vertebræ, fifty-nine. The length rarely exceeds ten inches, but it has been known to be above fifteen.

Of the *Welsh charr*, or torgoch of Llanberis (*Salmo Cambricus*), the following characteristics are given: "The body is compressed and lengthened; length of the head considerably more than one-half of the distance from the snout to the line of the origin of the dorsal fin; upper profile of the head not elevated above the margin of the orbit, and is not even slightly ridged, but slightly concave; the median ridge scarcely visible; snout rather depressed, the lower a little curved

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upward, and overreaching the upper; nostrils midway between the eyeball and end of the snout, the foremost round, open, surrounded by a membrane which posteriorly is developed into a small flap, which does not exist in the charr of Windermere, and in this species almost entirely covers the smaller, oblong, posterior nostril. By this character alone the torgoch may be distinguished from the last-named species and the charr of Lake Melvin. The mystache scarcely extends beyond the hindmost border of the eye, and has from nineteen to twenty-one teeth, six or seven in each intermaxillary, seventeen to each mandible, seven on the vomer (where they form two sides of a triangle), fifteen on each palatine bone, and five pairs on the tongue. Origin of the dorsal fin a little nearer the snout than to the root of the tail, with thirteen or fourteen rays, the first very small, the sixth longest. Anal fin with eleven or twelve rays, the first exactly in the middle, between the roots of the tail and of the outer ventral ray, the first ray very short. Pectoral fin with twelve or thirteen rays, its base overlapped by the gill-cover, and extending three-fourths of the distance to the origin of the ventrals; ventral fins with nine rays; tail concave. The scales thin and small; colour of the back dark sea green, lighter on the sides, a bright red below, the sides often with numerous reddish orange-coloured spots; pectorals greenish, passing into reddish posteriorly, the upper margin white; ventrals and anal red, with white anterior margins; dorsal and caudal blackish, with broad lighter margins; cheeks with numerous black dots." To this account of the colour of this beautiful fish we add from Mr. Hansard that the hues are splendid beyond all example among the fishes of this country. Nothing can exceed the fervid aspect of its colours when first taken. The scarlet of the body may be said to emulate the glowing redness of the fiery element; the upper part of the head and back deep purplish blue, blending into silvery near the lateral line, below which the sides are tinged with yellow, passing into orange, and then into fine scarlet towards the belly; the back and sides spotted beautifully with fine red, the flesh within a deep red. Number of the vertebræ, sixty-one

The following is a description of Gray's charr: Head and body compressed, slightly elevated, the greatest depth below the origin of the dorsal fin, upper profile of the head elevated above the border of the orbit, the diameter of which is one-fifth of the length of the head, shorter than the snout; inter-orbital space convex, with a prominent ridge along the middle, and with a pair or series of pores. Snout slightly compressed, subconical; length of the jaws equal. Nostrils midway between the end of the snout and the border of the eye, the hindmost wider and round, the anterior a very narrow vertical slit, both separated by a narrow cutaneous

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bridge. The maxillary (mystache) extends to the vertical from the hindmost border of the eye, and is armed with sixteen very small teeth, the hindmost rudimentary; all the other teeth small, four in the inter-maxillary, twelve in each mandible, two to four in the vomer, fifteen on each palatine, and four pairs on the tongue. The sub-operculum, which forms the hindmost part of the gill cover, does not cover the exposed portion of the shoulder above the root of the pectoral fin. Dorsal fin with thirteen or fourteen rays, its origin nearer the end of the snout than to the root of the tail, fourth and fifth rays the longest. The distance of the adipose fin from the dorsal is less than twice the length of the base of the latter; anal fin with twelve rays, its origin at the middle between the root of the caudal fin and of the outer ventral ray; fourth, fifth, and sixth rays the longest. The tail forked, the lobes pointed. Pectoral fin with thirteen or fourteen rays, its base free of the operculum, and ending at a short distance from the ventral; ventral with nine rays, its origin below the ninth, tenth, and eleventh rays of the dorsal. The scales very conspicuous and comparatively much larger than in any other of the British charr; those of the lateral line not larger than the others. As regards colour, the sides and belly are silvery, the scales on the sides of the back have a silvery centre and a blackish border; the back itself is a bluish black; belly with a reddish shade; sides with scattered light orange-coloured dots; fins blackish; the dorsal lighter superiorly; ventrals with a narrow whitish border. Head silvery, black above.

The capture of these fish is effected by three methods—the net, trolling, and the fly. The former seems to be the most deadly method, and very reasonably so, it being essentially a bottom fish, feeding on minute shell fish, and rarely coming to the surface to feed. In some localities, however, they are said to take the fly freely, and, according to Stoddart, those of Haweswater, near Bampton, do not seem very particular as to the colour, &c., the ordinary trout flies of the neighbourhood being capitally effective. This is also, he says, the case in the smaller Highland lakes, Loch Lee, in Forfarshire, and Loch Achilty, in Ross-shire. In the latter, he remarks, "I have basketed as many as a dozen-and-a-half in a forenoon, along with some dozens of trout." The fish takes the fly much more deliberately than a trout, and, like a grayling, once having missed its aim, it often repeats its attempt.

Artificial fly fishing for charr is, however, but poor sport, and it is chiefly to the spinning minnow or spoon bait and its genus that the angler must look for sport. It is common to row backwards and forwards over the deeper parts of the lake, trailing a bait of this nature, and allowing it to sink to a considerable depth. A friend tells me he has had remarkable sport with Gregory's "Cleopatra" bait (described anon),

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and I should think the report very likely to be true. The time for such fishing is during spring and early summer. A writer in a contemporary, under date 18th April, 1866, refers to charr of 2lb., but names, as an average size, half-a-pound. I should be disposed to consider this too large, however.

Probably, owing to the rarity of the fish, it is esteemed as a delicacy, and is, or was, largely sold potted. I do not think much of its flavour.

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CHAPTER XXXI.

THE GRAYLING.

WE now come to the grayling or umber (*Salmo thymallus*). To all students of nature, the beauty and the historical, no less than physical, associations of this fish render it extremely interesting. To the angler, in regard to the sport its capture affords, it ranks next the trout, if, indeed, in some cases it does not take precedence of this fresh-water autocrat.

The appearance of this fish is superbly beautiful; the engraving conveys a satisfactory idea of its outline, symmetry, and general characteristics, but of course does not exhibit the hues and various colours—variations to be observed in the real grayling as it dies on the bank. A far abler pen than mine has described the fish, and I quote the description.

Ronalds thus speaks of it: "A general tint, which may be called a light blue silvery grey, pervades nearly the whole surface of his body, excepting the belly, which is white, or nearly so, but the scales often exhibit iridescent lines of great beauty. The back and head are of a much darker grey. . . . . Some lines of brown are intermixed with the grey of the sides, and a few black spots are seen near the shoulder. The back fin has a purplish tint, studded with large dark spots; the other fins are not so red as those of the trout, but have more yellow-brown in them, shaded off with purple; the tail is a kind of slate colour." Of course, ample and, indeed, sufficient for the purpose as this piece of word-painting is, nevertheless, as I have before observed, the grayling must be seen to be appreciated. Its iridescence on some occasions, as it lies panting after a more than usually courageous combat, becomes extremely beautiful. *Apropos* of this iridescence, my readers generally may not quite know on what it depends. We are told by Sir David Brewster, in his "Treatise on Optics," that "it is obvious

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that the splendid colours of mother-o'-pearl, &c., are produced by a peculiar configuration of surface, and by examining this surface with the microscope he observed in almost every specimen a grooved structure like the delicate texture of the skin at the top of an infant's finger." The iridescence of the grayling and that of mother-o'-pearl are similar, and I have examined the smaller scales of a grayling and find this grooved structure very pronounced. I believe also that the increase of iridescence, on special occasions, is due to an almost imperceptible tremor of the scales and fluctuating alterations of tint in the pigment under the skin. Another peculiarity of the grayling not noticed in the above description is its lozenge-shaped though large and brilliant eye, which gives it a somewhat sinister expression of countenance; an expression which from the same cause, by the by, sometimes renders the features of our celestial friend the "Heathen Chinee" so unprepossessing. Altogether, however, the grayling is a light, graceful, and vigorous fish, of a widely different stamp of beauty from the "lusty trout," as the Laureate terms him. Indeed, a recent writer has compared the trout to Hercules and the grayling to Apollo, and Mr. Francis has very happily and prettily styled the former the "gentleman" and the latter the "lady" of the streams.

Yarrell supposes that the large dorsal fin is to enable it to rise and sink rapidly in deep streams, but its large swimming bladder seems rather to afford this faculty. Without doubt its other fins, small as compared with the dorsal, preclude it surmounting the difficulties easily compassed by trout, and it therefore invariably contents itself with the deeper and quieter parts of the river or brook. Its chosen stations are invariably rivers free from turbulence, possessing water usually clear and always cool, but less than severely chilly. It is not migratory, though Bloch and Donovan both state that it is. Sir Humphrey Davy demonstrated the fact that the fish cannot live in brackish water.

The idea that this fish was imported by the monks from the Continent seems feasible, but there is no reliable data in connection with the matter. Mr. J. J. Manley, in his "Notes on Fish and Fishing," objects to this idea, on the score that the grayling is too delicate for transportation. As a matter of fact, this is incorrect, it being quite as well able to sustain fatigue as its more lusty congener the trout.

Analogous to the mistletoe, which, owing to a Druidical excommunication laid on Devonshire, is said not to grow in that county, the grayling, for some occult reason, will not pass into Somersetshire. Yorkshire, Derbyshire, Herefordshire, Hampshire, and Wiltshire are of his most loved counties, and yet he is a particular fish in the selection of water, even when in the right county. The Test, Dove, Derwent, Teme, Hampshire Avon, and Lugg, are also among his most loved rivers. He is not

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found in Scotland, but Switzerland, Lapland, Norway, and the Orkneys all possess him. Wales does not, neither does Ireland.

The food of the grayling is almost purely the ephemeræ. Ronalds says, and so do other authorities, that it seldom takes the minnow, and my experience corroborates this. It loves worms, however, and a gilt-tail or cock-spur, next to the grasshopper, is perhaps his most perfect ideal of a toothsome morsel. The fly, however, is the proper food of the grayling, although a quaint writer (Franks) remarks: "Yet for this fly-admirer there is another bait—the munket or sea-green grub, generated amongst owlder trees, also issues from willows, sallows, &c." I have taken several caddis-worm cases, with the attached shells and stones, from a grayling's stomach on more than one occasion. Gentles are also welcomed by them. It also largely obtains food from the mud and gravel, and not unusually takes into its stomach large quantities of both. Yarrell refers to some grains of gold, which were probably present in such soil, being taken from a grayling's stomach, and remarks that it has been connected with the colour the fish sometimes presents—an inclination to golden.

The habits of these fish are somewhat different from those of the trout. They are more gregarious and less shy than their "lusty" friends. Also they never evince that steeplechasing desire peculiar to trout in the spawning season. In fact, instead of trying to leap whatever obstacle may be in the way of an ascent to the higher parts of the river, they prefer "swimming with the stream," and therefore drop from pool to pool at this season until a suitable spot at the tail of a swift "shimper" is reached, where the roe is deposited in the gravel. This piece of family duty is accomplished in April, or, at the latest, May. Hence grayling are generally in best condition from October to February. They do not breed until three years of age, when they have, technically, attained the majority of graylinghood, being at first a pink, next a shut, shett, or shot, and finally *Salmo thymallus*, in all the importance of his "thymy" odour and iridescent complexion.

The term *thymallus*, as applied to this fish, is from a fancied or real smell of thyme which the grayling was said to emit on being drawn from the water. Walton conjectures that this odour is derived from the fish feeding on water-thyme. This idea, however, is erroneous, for, as far as I could ever find, grayling consume no vegetable at all, being thus in keeping with their near relatives, the salmon and trout. Mr. Manley has suggested that the odour perceptibly emanating from a well-conditioned grayling is like that of cucumber—this is certainly not due to their eating cucumbers, is it, Mr. Manley? Except in a very few instances, I have detected no "thymy" odour, and my opinion of the smell of a fresh grayling generally is that it is of fish, fishy, and as such

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does not deserve the oft-quoted patronymic given it by St. Ambrose of "flower of fishes"—at any rate, not from its usual smell. For the name grayling there is a better justification. The fish usually is of a silvery greyish appearance—hence grayling.

The other title, of *umber* (from *umbra*, shadow), is also well deserved. Unquestionably the fish is one of the swiftest and most fluent of swimmers, and its dark back, as it shoots in summer from one side of a stream to the other, lends it a shadow-like appearance which might well suggest this name. This explanation is given by Hippolito Tolivani in his "De Piscibus cum eorum Figuris." Says Ausonius—

> Effulgens oculos celat levis umbra natatu.
> The smooth-scaled *umbra*, as it passes by,
> Flits as a shadow o'er the gazer's eye.

But Cotton tortures another derivation out of umber, and says it is from some shadowy markings occasionally found on its belly and head—a far-fetched idea, which need not occupy us a moment. The first is undoubtedly the true explanation.

Of course the grayling is "very medicinable"! Walton quotes Gesner to the effect that the fat, "being set with a little honey a day or two in the sun, in a little glass, is very excellent against redness or swarthiness, or anything that breeds in the eyes." Let the ladies take a hint from this.

As before indicated by the title, the "flower of fishes," applied to it by St. Ambrose, the grayling must have been held in high estimation. And, as may be supposed, when angling as a "fine art" was not, this estimation was based on some real or fancied gastronomic excellence. Thus "The Boke of St. Albans:" "The grayllynge, by another name called umbre, is a delycyous fysshe to manny mouthes." It should be cooked as soon as possible after it is out of the water. Gesner names it as the choicest of Swiss fish. Italy and France also esteem it; and our own Cotton says: "His flesh, even in his worst season, is so firm, and will so easily calver, that in plain truth he is very good meat at all times, but in his perfect season . . . I think him so good a fish as to be little inferior to the best trout that ever I tasted in my life."

For my own part, I am more inclined to compare it with the carp than trout, as about on an equal with that fish, both being, of course, in good condition. Perhaps in saying this I am unconsciously following the story told in that quaint old book, written by nobody knows whom, "Dialogus Creaturum Moralizatus," published first in 1480, and which I referred to when speaking of the carp. I advise all curious

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gourmands to follow Judge Dolphin's plan there described, and taste the two fish and then decide. Do not take my word for the excellence of either.

As I have before indicated, grayling are in season about the time when trout are busy with their domestic affairs. Grayling are not so susceptible of debilitating influences as trout, however, and it may be safely said that they, like the eel, are never entirely unfit for sport or food. From October to February may be pronounced the most preferable period nevertheless, and the angler, if he deserve the name, will refuse to wet a line for them during spawning time. During May, June, and July, however plump and fat they may appear to be, they are out of condition. Mr. Francis pronounces in his book an elaborate and intensely humorous anathema against those who make sport of the grayling out of season. It is worth reading.

The methods of grayling capture are much the same as those employed for brook trout. To be sure, he does not affect the minnow, but in regard to his ephemeral food—flies, grubs, caterpillars, &c.—there is very little difference in the appetite of the two. The axiom when angling for grayling laid down by Ronalds should never be forgotten when a choice of flies is being made: "The angler should bear in mind that the coleopteron or beetle will be on the water on hot days principally; the ephemera, or fish fly, on rather cold days; the phryganea or water fly, as the grannon, &c., on cloudy days with gleams of sunshine; the diptera, and other land flies, as the cow dung, &c., on windy days." For my own fishing I always begin with a palmer as a stretcher, and the fly which seems most suitable as a dropper, and have found such an arrangement could hardly be improved on. From the grayling being, if anything, a quicker sighted fish than the trout, it is necessary that the finest tackle be used, and large flies must be eschewed—the grayling is truly the "lady" in this respect, nothing coarse or gross will allure it.

The flies given in the list for trout are, in the greater number of cases, applicable to grayling, and I shall only seek to vary the selection by giving the "fancies" of Jesse and Sir Humphry Davy, both enthusiastic grayling fishers of the old school. Ronalds very truthfully remarks:

"The principal differences between trout and grayling fishing are, that the latter requires a more delicate hand, a quicker eye, and the use of smaller flies upon the finest gut. The strike must be made on the instant of the rise. The fish may be sometimes seen, if he be of a good size and the water bright, a few inches before he gets up to the fly, and the fisherman must strike immediately that he does so, for his motion at the instant of seizure is too rapid to be visible.

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"When the fisherman comes upon a favourable place for grayling, he should recollect that this fish does not follow the fly as the trout does, and should therefore allow it to float down the stream in a natural way, for should a grayling be waiting for it, when it is drawn away, the fish will be disappointed of that which it was the fisherman's intention to entertain him with.

"It must also be remarked here that the mouth of the grayling is much more tender than that of the trout; therefore much more care in landing is required, and a landing net is generally indispensable, especially when the banks are high, for the mouth will seldom bear the weight of the fish out of the water."

Thus Ronalds, and I may here fitly add the names and markings of the flies given by Jesse:

"*Spider Fly.*—End of April. Very killing, both for trout and shett grayling. Body, either pale grey silk or strand of peacock's hard, with the green stripped off it. Wing, woodcock or grouse feather. Legs, black hackle, and made long.

"*Fern Fly.*—June till end of September. Body, bright orange silk. Wings, light woodcock feather. Legs, red hackle. A capital fly.

"*Red Ant Fly.*—Body, peacock's hard, and crimson, with silk under the wings. Wing, stare's feather. Legs, red hackle. From end of June till middle of September.

"*Seg Fly.*—Middle of September till end of October. Wing, land rail's feather. Body, as near the same colour as possible. This and the next—

"*The pale blue, or 'Fisherman's Curse,'* from its being so difficult to imitate. Two of the best flies in the whole year. The only thing I ever found to succeed for the wing or legs is the feather of the tern or sea swallow; and the body of the same coloured dubbing, mixed with a little yellow.

"*Light Willow.*—September and October.

"*Dark Willow.*—End of September till December.

"A blue dun and dark palmer," says Jesse, "I never found fish refuse in any river I ever yet fished in, and a little red palmer, made from the very moon of the peacock's feather, grayling will take at all seasons of the year."

The rod need not vary much in grayling fly-fishing from that used when trout are being sought for. I usually find a light single-handed fly rod of ordinary make sufficiently near the mark. The reel and line recommended for that will also do, and the flies should in all cases be smaller and made with the greatest nicety. In approaching the water one ought to be exceedingly careful to remain as nearly unseen as possible.

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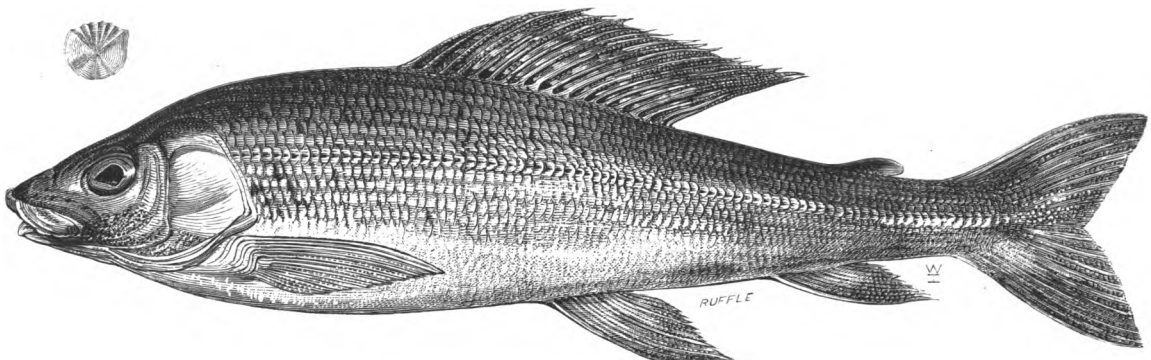

THE GRAYLING—(*Salmo thymallus*).

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And now as to a few notes as brief as possible in reference to fly-fishing for grayling. Always throw down stream or across, because the fish is very probably, unlike the trout, waiting for the fly, having seen it from afar. Do not, therefore, be in a hurry to make your casts; be deliberate, and, above all, be watchful and ready. The grayling often takes its food below the surface; indeed, it is often necessary—and always for the larger fish is it so—that the bait sink some six or more inches; the angler in such a case must and can only trust to his sense of feeling. The cultivation of this sense is very desirable in a grayling fisher. Strike with a sharp yet not violent wrist motion, and play your fish "as if you loved him," lest he break away like the fox in the fable, leaving a part of his anatomy behind—in the case of the grayling its lip. The fragility of the jaw of this fish is indeed astonishing, and the very gentlest and most skilful handling is usually absolutely necessary.

Curiously enough, "Piscator," in the "Practical Angler," dissents from this, and says: "Grayling is not, as is generally stated, the most tender-mouthed of all fishes, an opinion I certainly once entertained of him upon the authority of others, until a more intimate acquaintance with the subject has convinced me such is not the fact." This author is wrong, however.

Mr. Francis says, in reference to the fish's habits in taking the bait on the surface and below it, "he has always one of his lozenge-shaped eyes on the top of the water as well as at the bottom." It matters, therefore, little what the water is like. There is ever a chance for the grayling fisher.

Jesse also corroborates the idea of allowing the bait to sink somewhat. This is what he says: "You will always see any person who is a stranger to grayling fishing, and I may add many who have fished for them all their lives, when the water is very low and clear, immediately betake themselves to the streams and curls, from the idea that the fish will see your line in the dead water. Let them do so; they will perhaps catch a few trout, and some shett grayling. But go yourself to a deep, dead part of the river—never mind if there is no wind, or if the sun is hot—use the finest gut you can procure (even if you give a guinea a knot for it), and two flies, and when you have thrown your line as light as gossamer, let it sink for 8in. or 10in. You will not see a rise, but a slight curl in the water, which by a little practice you will understand quite as well, and when you strike you will have the pleasure of finding a pounder or more tugging away at the end of your line. This is the real secret of grayling fishing, and I have often filled my basket, while eight or ten other fishermen on the water, using the very same flies, have not managed to kill a decent dish amongst them all."

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The attentive reader will recognise in the foregoing slight list some *replica* of the flies given by Ronalds, and though the variation made is slight, the difference, nevertheless, is advantageous to the angler. The following remark by Sir Humphry Davy, the great chemist, in connection with the same matter, will prove instructive. I transcribe it in full because nobody can improve on its compression. He says: "In March the dark-bodied willow fly may be regarded as the earliest fly; the imitation of which is made by a dark claret dubbing and a dun hackle, or four small starling's wing feathers. The blue dun comes on in the middle of the day in this month, and is imitated by dun hackles for wings and legs, and an olive dubbing for body. In mild weather, in morning and evening in this month, and through April, the green tail or grannon comes on in great quantities, and is well imitated by a hen pheasant's wing feather, a grey or red hackle for legs, and a dark peacock's hard, or dark hare's ear fur, for the body. The same kind of fly, of a larger size, with palm wings, kills well in the evening through May or June. The imitation of a water insect called the spider fly, with a lead-coloured body and woodcock's wings, is said to be a killing bait on this and other rivers, in the end of April and beginning of May; but I never happened to see it on the water. The dark alder fly, in May and June, is taken greedily by the fish; it is imitated by a dark-shaded pheasant's wing, black hackle for legs, and a peacock's hard, ribbed with red silk, for the body. At this season, and in July, imitations of the black and red palmer worms, which I believe are taken for black or brown or red beetles or cockchaffers, kill well; and in dark weather there are usually very light duns on the water. In August, imitations of the house fly and blue bottle and the red and black ant fly are taken, and are particularly killing after floods in autumn, when great quantities of the fly are destroyed and washed down the river. In this month, in cloudy days, pale blue duns often appear, and they are still more common in September. Throughout the summer and autumn, in fine calm evenings, a large dun fly, with a pale yellow body, is greedily taken by grayling after sunset, and the imitation of it is very killing."

The time of striking a grayling is at the moment he breaks the water. But, says some critical reader, grayling do not always break the water. I am willing to admit this, and I can in such case only suggest a "higher education" of the eye, that it may even notice the oily coil of the currents made by the twist of the animal's caudal extremity. And this strike must by no means be a fierce upward stroke of the rod. The tiniest jerk from the wrist is sufficient. A writer whose experience is remarkably large, Mr. W. Bullock, thus writes, in the *Fishing Gazette*, anent the fault of vigorous striking, a striking from the elbow and

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shoulder: "Placing a book between your arm and body, just below the elbow joint, is a sure test, and the only way I know of curing this laborious style of throwing a fly." And he goes on to state: "The hand should be raised up and down perpendiculary to a line drawn across your breast; and only in the case of having an extra average of line to throw, the wind against you, should the elbow ever be raised in conjunction with the hand and wrist."

As a sport, I certainly admire grayling fly-fishing before trout fishing. At least, I think I do, perhaps, because it is only of recent date that I had a capital day with this fish.

Large grayling do not rise nearly so freely at the fly as do the smaller sort, and in this respect they resemble trout, the larger of these fish undoubtedly being taken with the worm, or bait other than the fly, in the majority of cases. There is also a similarity between the fishers of each fish, inasmuch as even as it is difficult to find a really clever worm or minnow angler for trout, so is it rare that one comes across a good and expert grasshopper or maggot fisher for grayling. I therefore desire to devote a few lines to the instruction of the tyro in grasshopper fishing for grayling.

The best rod for this business is one of tolerable pliancy, of about seventeen (or a little less) feet in length—this is for those anglers who prefer a double to a single-handed rod for all purposes where available. Personally, however, I prefer a rod that can be used single handed. The gut should be drawn, and about two yards in length; the hook a No. 2 or 3 Limerick, around which has been moulded a strip of lead foil, which is, in turn, wrapped with pale green, a straw-coloured silk, and bound with gold silk. The lead should not encroach on the play of the hook, but be scooped away in the bend. A float made from crow quill, not more than an inch in length, is next fastened to the gut line, and need have but little reference to the depth, as it is always above the water and simply serves the purpose of intimating surely to the angler's eye the time when a fish has taken the bait.

The grasshopper or cricket is the bait, and the former is easily obtained in summer. Select those of medium size, and take off the two muscular jumping legs before placing them in your live box. This may seem a cruel proceeding, but it does not inflict so much pain as it, at the first idea of the matter, might lead the uninitiated to suppose, judging from the fact that grasshoppers often cast one leg themselves on being captured. However, remove the legs as carefully as possible, and keep the grasshoppers in a somewhat deep gentle-box, that they may not have a chance of clambering out when the lid is lifted.

The method of baiting is as follows: Pass the hook in at the back of

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the neck and along down the back, but not out. You are then ready for grasshopper-fishing.

In "Tackle and Tackle Making" will be found particulars of some very excellent imitations of grasshoppers and grubs, which are often of great value to an angler, although never equal to the natural bait.

We will now suppose ourselves at the side of the stream, with either of the baits before given attached. The time should be as early as the habits of the angler will permit, for as with the proverbial early bird so with the angler. We will furthermore suppose the angler is at the head of a good, clean, long, gravelly swim about six feet deep. The crowquill is placed just above the water on the fine silk undressed line—not below, as some suggest, my opinion being that grayling at once perceive the moving white float, as it moves if it be so fixed. Above the water some few inches, therefore, be it. The motion is to be described as a sink and draw, and I always found it advisable to fish up-stream, for the reasons given in the place for up-stream fishing in the chapter devoted to trout. The essential point in this sink and draw motion is never to let the bait rest for more than just the tenth part of a second, or it touches the ground. Let it it be incessantly moving, so far as you are concerned, and when it stops at all, then is the time to strike.

Perhaps you are quietly fishing, and quite unconscious of the proximity of the grayling. But, see! your tiny float stops slightly in its descent—and, yes! Did you not feel the almost imperceptible motion of something alive at the end of your line? That was a grayling, who, with ladylike gentleness, took the bait. Strike! You have the fish.

No amount of writing will teach the angler when to strike in this particular style of fishing. The precise time must be learned, and it is acquired by the respective and harmonious education of eye and hand.

The time, as I have intimated, *when* to fish, is early; and indeed, it should be added, before the flies arise. When the flies are on the water, I consider it a sin to use a bait of this kind, but cannot go quite so far as Mr. Francis in his condemnation and comical anathema of all sorts of bait for grayling but the fly.

By the bye, unlike the trout, if the angler miss the fish once, or even, as I have done, detach a part of its jaw, it will not be daunted, but, pike-like, will frequently, in the language of the prize ring, "come up again smiling" to its ultimate destruction. It

> Unabated will dare,
> Baulked e'er so oft the disappointing snare,
> Simple and bold.

The latter words of this quotation hit off its character to a nicety. Therefore, if a good fish is suspected, rises, and is missed, persevere!

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It may involve the change of a fly, but the result will most probably justify the trouble in a good two-pounder. By the bye, grayling rarely exceed 4lb. Jesse, the well-known author of "An Angler's Rambles," records one of 4½lb., which was sent him by a member of the Houghton Club, and says: "Mr. Pennant mentions one which was taken near Ludlow above half a yard in length, and weighing 4lb. 6oz." Yarrell speaks of three weighing 12lb., from Ringwood, one of 5lb. near Shrewsbury, and Nillson refers to grayling 8lb. and 9lb. in Lapland, but the extreme weight renders it uncertain if the species is the same.

The reader having thus borne with me while I descanted on the technicalities of the grayling and his capture will also, I make no doubt, follow me as I describe an ideal morning's grayling fishing.

It is November, and the grey dawn has just made its appearance in the far east; but the chilliness of the night watches and the silence are yet over all. A spring from the warm bed, and a plunge into the awaiting cold bath, are like honest criticism, not especially pleasant, but bracing and invigorating when the first shock is over; and as I apply the rough towel with briskness the prospect through the open window (all fishermen and those likely to expose themselves to "weather" should sleep with the window well open) brightens, and a line of silver, followed by gleams of pale sheeny light, proclaims the near advent of the god of day. The useful spirit lamp is lighted, and by the time I am dressed a steaming cup of chocolate is ready—fit fortification against the sharp air of the morning.

Down-stairs I stealthily creep, lest the other occupants still in the embraces of the sleepy deity turn over and anathematize my wide-awake self and the fascinations of the "gentle craft." Imprecations are not well laid out when expended on fish and fishermen.

I pass through the hall door, creel on back and rod in hand, and the beauty of the crisp frosty November morning bursts fully upon me. Sunrise from Chamounix may fill the heart with transports; sunset on Como may delight us with glories of colour and perfumed breezes. But to me the beauty of an English sunrise over the varied luxuriance of foliage in summer, and the "myriads of topaz lights and jacinth work of subtlest jewellery" like the hilt of Excalibur—when in early winter the hoar frost gems the fairy branches of the birch and the remaining leaves of the beach, and scatters diamonds broadcast over the green lawn—is far superior. Half the sweetness of nature is in one's own appreciation. How much, therefore, is the scene enhanced when fraught with the expectation of sport, whereof the world provides none surpassing successful grayling fishing.

Winding amid dells and through grots of unexampled solitude and

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natural retirement flows a brook which in the sunshine is a stream of silver. Swift without turbulence, "strong without rage, without o'erflowing full," its pellucid waters give indication even from afar of many a "lusty" trout and many a grayling. As I approach and set foot on the rustic bridge formed of unhewn oak and based on beech roots which seem to clutch the ground with muscular, talon-like fingers, a trout starts from the shadow, and with lightning celerity and silence a swift umber or grayling speeds into the darkness of a contiguous deep. In the distance another takes a fly with happy complacency, and as the gentle eddy closes over him yet another follows suit with obtrusive demonstrations, and that sonorous roll which is even more characteristic of a trout's plunge than that of a grayling. Truly there are here indications of a sufficiently assuring nature to warrant "great expectations."

It is now six o'clock, and the whippy three-joint rod is put together, the line duly passed through the rings, and the casting lines made from the "grey palfrey's tail" attached. I lightly whip it into the stream to soak as I proceed to load and light the greatest luxury of the world—the first pipe. Just three mighty draws at its fragrant contents and one modest sip from the tiny flask, and the cast is soaked enough to give it elasticity, and so are the hair mounted flies—of almost miscroscopical size—previously placed in the water in the gentle-box, amongst the gentles too—but never mind, the latter stand a lot of drowning. The flies are securely tied, and with care I prepare to get out the line for the first cast.

Ah! the *first* cast! a chapter might be written on it, for I have a superstition that a great deal depends on the success of getting out the line for and the making of that first essay. I don't mean the *first* "cast" of one's angling experience, though I remember mine was on the root of a curious and impertinent cow's tail with a bran new flight of jack hooks, which of course failed to "land" the bovine quarry. No; I mean the first of the day, which strikes the key note of one's temper and patience for the rest of it. However, I get the first cast properly out and without hitch or stay, fish on. My flies are simply imitation house flies, tipped with a small white gentle, by which I try to satisfy the, as I think, despicable whim of mine host, who has invited me to a week's grayling fishing. The stream as I walk down grows wider, and I see not so far from me the white shingles of a trout spawning bed. Behind that spot there is probably a deep wherein I prophesy are a grayling or two not disdainful of any stray ova that the stream may kindly wash to them from their busy cousins above.

Receding now from the water I gradually approach the pool aforesaid, and light as a mother's kiss on her baby's face, or softly as falls on the

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water a snowflake—any other simile showing delicacy and gentleness will do, dear reader, if you are dissatisfied with these—my three tiny lures drop in the centre of an oily curl and slowly disappear beneath the surface. The faintest movement in the water—not strong enough for a ripple—ensues, and I know its import. I strike sharply but not strongly; he has it, and I feel the exquisite thrill, like some ethereal current of electrical joy, tremble in every fibre at this the first fish. No subsequent fish produces a like sensation, and, though I would like, I cannot communicate what it is like in the fresh brightness of the morning as it permeates the frame of the healthy enthusiastic angler. It is not a pleasure of sense but of the soul.

The reel whirrs, and gamely the beautiful fish fights, and I, willing to prolong the combat, handle the rod as befits my fealty to this "the lady of the stream;" and am I not mindful also that the lips of the grayling are tender and fragile? So I am not in a hurry to place the net under my iridescent prize, which I have by this time brought within distance on the shallow, where it lies panting and silvery with its fins quivering, and its lustrous eyes, almond shaped like those of our friend the heathen Chinee—by Jove! jump! flap! kick!—very much like that deceitful heathen Chinee, for the beggar's gone, and I didn't think there was a kick left. This comes of sentimental morning rhapsodies instead of keeping up the character of the "practical fisherman."

"Dear me, this mustn't occur again," I soliloquise, and during that morning I take great care it does not, for the fish was at least a pound, and a pound of grayling is remarkably good sport all at one time, especially in these streams.

In fly fishing especially, success depends on instinctive perception—not nonsensical homilies. At first the tyro, by an effort of will, learns from close observation how best to do what he wants to accomplish. For example, he searches with all his senses and intelligence *rampant* for the form of a fish, and then estimates all the chances of throwing, and suitably and actively consorts all his mental and physical qualities for the accomplishment. Lest I seem ambiguous, let me say he *tries* to do all he does do, even to the detection of an almost imperceptible rise, and the hooking of the striking fish. Herein lies the difference between himself and the experienced angler. Trying by means of the true rule to shoot a bird, viz., of holding the gun straight, is good, but being able to do so without thinking of the rule is better, and so with the fisher and fishing. A mental, tacit habit is formed in the good grayling fisher which is independent of his will, and he therefore sees a fish before others, and his wrist exactly tells him what strain he ought to put on it before landing, with an exactitude far "beyond the rules of art," and unattainable by

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the most elaborate mathematical theories. All this means that before I go a yard away from where I lost my grayling, I see unerringly in a far shadow the outline of another. *General Eye* thereupon telegraphs to *Major Wrist* the requisite message, and ere a second has elapsed the latter propels the line through the air, and the stretcher falls lightly as before (see *similes* above) within a foot of the creature's nose. He sees it, and takes it with some ostentation. Notwithstanding all my preaching, you see, I am a little flurried this time in dealing with my fish, especially as he is apparently bent on being obstinate; and, as he is evidently a good sized one, I am disposed to be rougher, and I am reminded that this will not do by the elastic giving of the hair cast. However, this fish is unquestionably mine, and I make security doubly sure by lifting it out at last in the landing net. He scaled 2lb. all but an ounce, and was one of the largest that had been taken for some time from the stream in question.

Now, if you are trout or grayling fishing, it is just as well, in the event of getting a good fish which you will like to exhibit as nearly perfect in colour and general symmetry as possible, to observe two things: these are, kill it, and wrap it in fine tissue paper. As I have before stated, grayling are best to eat before any change *at all* takes place, and they are unquestionably only handsome then so far as colour is concerned. The original of the drawing which is given of the grayling, before the artist, a most painstaking and exact draughtsman, had commenced to copy it, had been dead some twelve hours, and had, I make bold to say, died slowly from asphyxia. Hence it had lost colour slightly; there was faintly perceptible loss of symmetry about the head. Had it been killed and then enveloped in fine tissue paper this would not have been the case. The way to kill a trout or grayling, or, in fact, any fish, unless it be too large, is to take it round with the left hand below the gills tightly, and placing the thumb of the other in its mouth, jerk the head back sharply. This dislocates the vertebra behind the base of the skull. No other method of killing fish is nearly so clean and effective. Having thus despatched my prize and duly wrapped his body in fine tissue paper, I re-adjust the line and again seek sport. Two more fish are added to the creel by eight o'clock, and the "aching void" of which I am now intensely sensible by this time begins to increase alarmingly, so much so indeed that I am obliged to have recourse to my flask again. I couldn't leave the stream yet for half an hour, so I determine to make up the number of three brace if possible. I am not destined to do so, however, for an untoward event happens in this wise. After bagging two more beauties, I throw my line over to the neighbourhood of a likely looking spot, and immediately I

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hook, evidently a trout, for without more ado he runs round a root and then throws himself up into the air, snapping the hair-link like a carrot. I can't stand this happening with the sense of fierce hunger I am enduring, and so without more ado I reel up and betake myself towards the house, from which I now hear the sounds of the breakfast bell merrily tinkling, recalling the while old Walton's song—

Oh, the brave fisher's life!
It is the best of any,
'Tis full of pleasure, void of strife;
And 'tis beloved of many.
Other joyes
Are but toyes;
Only this
Lawful is,
For our skil
Breeds no il,
But content and pleasure.

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CHAPTER XXXII.

THE GWYNIAD.

MR. BUCKLAND gives the specific name of this fish as *Cregonus fera*, and intimates that, though for many years he had received eggs from the Huningue establishment of fish culture, he had, nevertheless, been unable to rear the fish by artificial means. Couch figures the fish most beautifully, and gives eight different specific names from eight different naturalists' writings. That adopted in the British Museum Catalogue is the one I prefer, as being most authoritative moreover — *Cregonus Pennantii*.

If confusion has hitherto existed in the case of the charrs, it has in degree been transcended by the muddle into which writers have fallen in connection with the identity of the gwyniad or guiniad (the word is of Welsh origin, signifying white, silvery, I believe). Yarrell says, "Some authors have considered the vendace of Lochnaben as the same with the powan of Perthshire, the schilly of Cumberland, the gwyniad of Wales, and the pollan of Ireland;" and Couch remarks on the name gwyniad, "Like all names which are simply descriptive, this has been applied to other species . . . . especially to the sewin, and especially to the younger conditions of the common salmon, from all of which the real gwiniad may be easily distinguished." Pennant, like Mr. Buckland, considered the gwyniad of our isles identical with the fera of Lake Geneva; but Willoughby must be credited with having distinctly shown this to be erroneous.

According to Mr. Buckland (who, however, says, "I do not know much about it"), the gwyniad is found in the isle of Bute, and by other writers it is stated to be known over a large portion of the Alpine or elevated districts of the Continent. In Britain its distribution is very circumscribed, even more so than the grayling. Where, however, it does exist, it is found in large quantities, and, according to Couch, this is

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particularly the case in Wales and Cumberland. He says, "They belong to the lakes rather than the rivers, and as they are at times found assembled in schools, and thus collected come near the shore in spring and summer, they provide a welcome feast for the people of the neighbourhood, for although not valued as a delicacy for the epicure, they are relished by those whose sauce is a good appetite." Pennant, who, as I have before remarked somewhere, told some miraculous fish stories, says, on the authority of somebody else, that between seven and eight thousand have been taken with a net at a single draught. They die very quickly out of the water, and are usually salted for preservation. Pennell says the fish amongst the poorer classes where it is taken is known as the "Freshwater herring."

This authority also thus refers to its habitat: "Ullswater and several others amongst the Cumberland lakes contain great numbers of the gwyniad, which in the vicinity goes by the name of gatelly, on account of its large scales. It occurs also abundantly in the neighbouring lakes of Haweswater, and is in all probability the cregonus, which is known to inhabit the Red Tarn, a small sheet of water near the summit of the Halvellyn, elevated more than 2000 feet above the sea level. Llyn Tegid, near Bala, was also at one time plentifully stocked with gwyniad; but the introduction of pike has, it is supposed, materially reduced their number of late years." It is also said to be taken in Coniston Mere, in Lancashire, and is reported to be found in Ireland. Both Couch, who obtained a specimen at Llyn Tegid, and Pennell opine that the fish referred to is the pollan, which differs from the Welsh gwyniad in the following particulars: In the snout not being produced, in the back fly being nearer the head, in the less number of rays in the anal fin, in the position of the latter in the back and tail fins being smaller, and in the third ray of the breast fins being longest, the first ray being of the greatest length in the gwyniad.

Like Mr. Buckland, I must confess to very scant knowledge of this interesting fish, never having seen but one specimen. I cannot therefore detail the method of its angling capture, if indeed there be any available. The following is the description of the specimen figured by Couch, and before adverted to: The example was 12in. in length and 2¾in. deep in front of the dorsal fin, from which part it first slopes gradually and then more rapidly to the snout, which overhangs the mouth; the slope from the snout to the mouth square, gape small; lower jaw short, slightly turned up at the symphyris as in the mullet, this jaw being received into the upper; no teeth, except a few fine ones on the tongue. Nostrils in a depression midway between the eyes and the snout; body compressed, more flattened behind the dorsal than in front of it, narrower

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behind the adipose fin and anal, which fins approximate to the tail; lateral line straight. The (first) dorsal rises 5in. from the snout, its front margin a little anterior to the ventrals, the first rays high, thirteen in all; pectorals long and pointed, eighteen rays; ventrals wide, with thirteen rays, and a very short one; a scale at its root the breadth of the root, the ventral wing short (scales of the body of moderate size); anal fin with thirteen rays, and a very short one; twenty-three rays in the tail, colour above dark, with a tint of blue; cheeks, sides, and below silvery white; fins a neutral tint. The eye is large, and the mystache is greatly curved, reaching back to the front of the eye.

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CHAPTER XXXIV.

THE POWAN.

THE Powan (*Coregonus La Cepedii or Cepedei*) is another herring-like fish, which has had bestowed upon it the cognomen "fresh-water herring." La Cepede appears to have been the first to describe it, and Dr. Parnell attached his name to it in consequence. This author refers to it as existing in Loch Lomond in great numbers. They are caught from March till September in drag nets, and occasional instances have proved that they will take the artificial fly; but a minnow, a bait liked by other members of the trout-like family, they have never been known to touch. Early in the morning and late in the evening large shoals of them are observed approaching the shore in search of food, and rippling the water with their fins as they advance. In this respect they resemble the Vendace, hereafter to be described; and I may remark that I have seen rudd do the same in a lake when in large congregation. They are never seen under any circumstances in the middle of the day. August and September finds them in the best condition. They spawn from October to the end of December.

As will appear from the description which follows of a specimen, 14in. long, there is very little danger of mistaking this fish for the Pollan; but Mr. Pennell has thought fit to give drawings of the mouths of each in different positions. I recommend the reader to consult the "Angler-Naturalist" for these. The difference is very striking. The originals of these, it should be said, can also be seen in Vol. II. "Yarrell's British Fishes," page 155.

The specimen from Loch Lomond above referred to is thus described: Head long and narrow, of an oval form, about one-fifth the length of the whole fish, caudal fin included; depth of body, between the dorsal and ventral fins, less than the length of head; colour of the back and side a dusky blue, with the margin of each scale well defined by a number of

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dark minute specks; belly dirty white; the lower portion of the dorsal, pectoral, ventral, and anal fins, dark blueish grey; irides silvery, pupils blue. First ray of the dorsal fin commencing half way between the point of the snout and the base of the short lateral caudal rays; the first ray simple, the rest branched, the second and third longest, equalling the length of the pectorals; the seventh ray as long as the base of the fin; the last ray one-third the length of the fourth; adipose fin large and thin, situated midway between the base of the fourth dorsal fin ray and the tip of the long upper ray of the caudal fin; anal fin commencing half-way between the origin of the ventral fin and the base of the middle caudal ray, the first ray simple, the rest branched; the second rather the longest, the third as long as the base of the fin; the last ray half the length of the fifth; ventral fins commencing under the middle of the dorsal; the third ray the longest, equalling the length of the lower ray in the dorsal pectorals long and pointed, one-sixth the length of the whole fish; caudal fin inchoate; the first ray simple, the second and third the longest, the last short, not one-fourth the length of the first. Tail deeply forked, with the long rays of the upper portion curving slightly downward, giving the fin a peculiar form. Gill covers produced behind the basal line of union between the operculum (gill cover) and sub-operculum oblique, the free margin of the latter slightly rounded; pre-operculum angular, snout prominent, somewhat of a conical form, extending beyond the upper lip; jaws of unequal length, the lower one the shorter; the maxillary bone broad, the free extremity extending back to beneath the anterior margin of the orbit. Teeth in the upper jaw long and slender, about six in number, those on the tongue shorter and more numerous. Eyes large, extending below the middle of the cheek, lateral, commencing above the upper part of the operculum and running down the middle of the sides to the base of the middle caudal ray. Scales large and eighty-four in the lateral line. The number of fins' rays, including the two short rays at the commencement of the dorsal and anal fins, are as follow: Dorsal, 14; pectoral, 16; ventral, 12; anal, 13; caudal, 20; the number of cœca 120.

According to Dr. Parnell, in the stomach of a powan he examined were found several species of the *Entomostraca* larvæ of insects, a few *Coleoptera*, a number of small, tough, red worms (probably of the *nais* species), and a quantity of gravel. The latter had most likely been swallowed in the search at the bottom of the water for such insects as inhabit the soil, or there find their *nidus*.

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CHAPTER XXXV.

THE POLLAN.

ICHTHYOLOGISTS are indebted chiefly to Thompson, the historian of the fishes of Belfast, for the knowledge of the habits and general natural history of the pollan of Ireland (*Coregonus pollan*), and, as I prefer in this case to have the information first hand instead of a thin dilution by Yarrell, Couch, Pennell, and others, I shall make free use of the paper of that enlightened writer.

It appears that the earliest notice of the fish is in Harris's "History of the County of Down," published in 1744, where it is referred to as a fish of Lough Neagh, under the present name of Pollan. Nothing further than a brief mention is, however, therein made, nor does more exist in the statistical surveys of the counties of Armagh and Antrim. Its habits do not, with the exception of its having been taken with the artificial fly, differ in any marked respect from either those of the vendace or gwyniad. It approaches the shores during spring and summer, and the following is Thompson's own account of a wonderful catch of the fish in 1834: "On the days of the 23rd, 24th, and 25th of September, 1834, which I spent in visiting the fishing stations of Lough Neagh, it was along with the common and great lake trouts caught plentifully in sweep nets cast at a small distance from the shore. About a fortnight before this time, and in the first week of September, the greatest take of the pollan ever recollected occurred at the bar-mouth, where the River Sixmile Water enters the lake. At either three or four draughts of the net 140 hundreds—123 fish to the hundred—or 17,220 fish, were taken. At one draught more were captured than the boat could with safety hold, and they had consequently to be emptied on the neighbouring pier. They altogether filled five one-horse carts, and were sold on the spot at the rate of 3s. 4d. per hundred, producing £23 6s. 8d." Our author further says: "They are brought in quantities to Belfast, and when the

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supply is good the cry of 'Fresh pollan' prevails even to a greater extent than that of 'Fresh herrings,' though both fish are in season at the same period of the year. In the month of June, 1834, fifty hundreds—6150 individuals—of pollan, and 125lb. weight of trout were taken at one draught of a net at another part of the lake near Rams' Island, which was the most successful capture made there for twenty-four years." This fish appears to have been very plentiful in 1834.

It further seems that though the fish is indigenous to Lough Neagh, it is by no means found universally over its area. Thompson remarks that it rarely occurs between the rivers Mayola and Toone, while from the Sixmile Water to Shane's Castle was so favourite a resort that a few houses which formerly stood near the latter locality were named "Pollan's Town" by some individual inclined to facetiousness. Of course, all this productiveness may now be changed; in fact, there can be no doubt that it is, and that woefully for the worse so far as pollan fishing is concerned.

The average weight of the fish when in season is said to be about six ounces, but I am constrained to believe that this estimate greatly outstrips the true average. I have received from the locality mentioned by Thompson several specimens in spirits, and not one goes over the average size of Westminster dace. I say Westminster dace, because, on calling on Gee, St. Andrew-street, one night, I found some splendid dace, which, he averred, were taken from the Westminster neighbourhood. In fact, he told me that his bait man never goes anywhere else for them. But this is by the way.

Thompson refers to pollan of 13in. long; but Couch gives a description of one of 9in. only. Even this is a large size; but, as it was observed by a careful naturalist, I shall give its technical description in preference to that of Thompson. Before doing so, however, I will refer to its food.

Yarrell says that in the stomach of a pollan given him by Mr. Thompson he found a species of gammarus (fresh-water shrimp tribe). Thompson also found the remains of the bivalve *percidium*, bits of stone and gravel, stickleback fry, and remains of the *Gammarus aquaticus*. In fact, sufficient evidence points to the conclusion that this fish feeds on food almost identical with that of deep-water trout. Of course, I make a reservation applying to flies in speaking of the latter. It therefore seems more than likely that bait-fishing for pollan would be by no means unsuccessful.

The details of this fish are thus stated: The body moderately lengthened, compressed, the proportions much as in a herring, the head flattened, above and behind the eyes narrowest, and sinking at the

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ventrals; jaws equal, the upper wide across and sloping down to the mouth, mystache wide and thin; teeth in the jaws few, very slight, not easily discovered, none on the palate, a circuit of fine teeth on the tongue; front of the tongue contracted and lengthened, eyes rather large. Body covered with scales, lateral line slightly sinking at first, then straight. First dorsal fin behind the centre of gravity with about fourteen rays; adipose fin posteriorly; tail forked, the rays twenty-three; anal with twelve rays, the first ray with more than twice the length of the last. Vent far behind; ventral fins large, and with twelve rays; pectorals sixteen. Colour on back dark blueish, pale yellow on gill cover, brilliant white on the sides and belly, iris yellow with an orange border. The pectoral fin in the instance under description measured an inch and one-eighth.

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CHAPTER XXXVI.

THE VENDACE, OR VENDIS.

THE Vendace or Vendis (*Corregonus Willoughbii*) is said never to be taken by rod and line. Whether it will ever become sufficiently plentiful for an indisputable decision on such an interesting point I cannot say, but as the fish is an actuality, and, moreover, a most beautiful member of the *Salmonidæ*, I cannot omit mention of it here. I have tasted it, and can at any rate accord it the praise of being meritorious on the table, if not as a sporting fish in the water.

Sir Wm. Jardine and Dr. Knox seem to have been the instructors of modern ichthyologists, and I shall quote freely from the former chiefly because, as he was a resident of the locality in which the vendace is famous, his evidence is least likely to lead to erroneous conclusions. Yarrell believes that this fish is the *Corregonus maræula* and the *C. albula* of Continental writers.

Although it is said to inhabit the north of Sweden, so far as Great Britain is concerned the fish is only known to inhabit the lochs in the neighbourhood of Loch Maben in Dumfriesshire, and in this district some curious superstitions are prevalent concerning it. The vendace, says Sir William Jardine, "is well known to almost every person in the neighbourhood, and if among the lower classes fish should at any time form the subject of conversation the vendace is immediately mentioned, and the loch regarded with pride as possessing something of great curiosity to visitors, and which is thought not elsewhere to exist. The story that it was introduced into these lochs by the unfortunate Mary Queen of Scots, as mentioned by Pennant in his notice of the Gwyniad, —and it is likely that his information was derived from the vicinity—is still in circulation. That the fish was introduced from some Continental lake I have little doubt, but would rather attribute the circumstance to some of the religious establishments which at one time prevailed in the

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neighbourhood, and which were well known to pay considerable attention both to the table and the cellar. Mary would scarcely prefer a lake so far from her temporary residence for the preservation of a luxury of troublesome introduction, and leave her other fish ponds destitute of such a delicacy.

"An idea prevails," says the before-quoted writer, "that this fish if taken from the water will die, and that an immediate return will be of no avail; and it is believed that it will not last in any other water than the Castle Loch. These are, of course, opinions which have gradually from different circumstances gained weight, and have at last been received as facts. The fish is of extreme delicacy—a circumstance which may give rise to the first notion—and the introduction of it must have taken place by means of spawn. The fish themselves, I am confident, could not be transported alive even a few miles. As to the second opinion, they are not confined to the Castle Loch, but are found in others, some of which have no connection with that interesting one thought to be peculiar."

"In general habits," he further goes on to say, "the vendace nearly resembles the gwyniad, and, indeed, most of the allied species of the genus. They swim in large shoals, and during warm and clear weather retire to the depths of the lake, apparently sensible of the increased temperature. They are only taken with nets, a proper bait not being yet discovered, and the fact that little excrement has been found in their intestines has given rise to another tradition, that they are able to subsist without food. They are most successfully taken during a dull day and a sharp breeze, approaching near to the edges of the loch and swimming in a direction contrary to the wind. They spawn about the commencement of November, and at this time congregate in large shoals, frequently rising to the surface of the water after the manner of the common herring, and making a similar noise by their rise and fall to and from the surface. The sound may be distinctly heard, and the direction of the shoal perceived during a calm, clear evening. They are very productive. The lochs abound with pike, of which they are the favourite food, but their quantity seems in no degree diminished, notwithstanding that immense numbers must be destroyed. They are considered a great delicacy, resembling a smelt a good deal in flavour, and, though certainly very palatable, the relish may be somewhat heightened by the difficulty of always procuring a supply. It appears, also, that they are locally known as 'Loch Maben whitebait.'"

Dr. Knox ascertained that the food of this fish consists, as is the case with the subjects of immediately preceding chapters, of entomostræa of exceedingly minute size. Yarrell examined the stomachs of several. He found the contained mass was of a brownish yellow colour, and when

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subjected to a microscopical scrutiny by Müller, the very common *cyclops quadricornis* was always present. Small coleopterous insects and the remains of worms were also determined at different times. Altogether, the conclusion may fitly be stated that the food is composed entirely of such minute crustaceans and larvæ as may be present in the water. Certainly, this investigation presents no great obstacle in the way of finding a suitable bait for its capture.

Dr. Knox also found that occasionally, as is the case with perch and other tribes, the females were more numerous than the males. Indeed, out of forty individuals, only two, on examination, turned out to be members of the rougher sex. On another occasion, however, the disproportion appeared very much reduced, proving that the fact was but indicative of some special habit of the fish, instead of showing an actual disproportion in the existing number of each sex.

Couch, who probably had a better chance than Yarrell of examining in detail these fish, gives a full description of one which was 6¼in. long. If the figure of the fish given by him in his work is a close likeness, it certainly is more roach-like in its proportions than those in the work by Yarrell and that by Mr. Pennell—these two are identical, be it said, the same blocks having been used. In any case, this is the description: Length 6¼in., which is about the usual dimensions; depth in front of the dorsal fin, 1⅝in., the outline rising from the front to the first ray of that fin; the body compressed, covered with scales of moderate size not easily detached; under jaw projecting; mystache broad, slightly bent, reaching halfway to the eye, gape very moveable. Eye large and prominent. Teeth: none in the jaws, minute on the tongue. Dorsal fin opposite the ventrals with eleven rays, as are also the ventrals, the two last from one root; pectorals free of the gill cover, reaching a little more than halfway to the ventrals, with fourteen rays; in the ventrals ten rays; adipose fin opposite the termination of the anal, and consequently not far from the tail. Tail broadly forked, with twenty rays. Colour of the back brown, the sides tinged with yellow, above the hindmost part of the eye golden, faint lines of yellow along the sides, but over the whole, and on the cheeks, a brilliant white. Yarrell says that the dorsal fin and upper parts of the side are a fine green. There are sixty-eight mucous pores in the lateral line.

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CHAPTER XXXVII.

THE BURBOT, OR EEL POUT.

THIS fish (*Lota vulgaris*) is the only one of the cod family that lives permanently in fresh water in England; and it is only locally known. It is found in the Trent, Cam, Tame, Ouse, Esk, and Skein, the Yorkshire Derwent, and the Yare, Bure, and Waveney in Norfolk. I once took one from the Wey, near Weybridge, which weighed half a pound; but, though all my family have lived thereabout for three or four generations, none remembered a similar capture. The fish prefers slow, oozy rivers to running, clear streams, and is very eel-like in its habits. It hides itself in corners and behind obstructions, only protruding its nose and eyes for such food as might unwittingly be borne towards it. At night time it is occasionally taken on an eel-line, but more frequently in eel baskets placed in the more secluded parts of the water—amongst water lilies, &c. It is very hard to kill, like the eel; and sometimes attains seven or eight pounds in size. This is, however, a very uncommon size, the usual weight being one or two pounds at the utmost. It is also found in various parts of Northern Europe, Siberia, Asia, and India.

The burbot—or, as it is sometimes called, burbolt—spawns about February or March, and, until that time, its flesh is white and firm and of good flavour, more like the eel than its congener the cod. I think it would unquestionably pay for cultivation, and it is almost certain it would thrive in large lakes. The Nottingham market sometimes shows some really fine examples.

According to Yarrell, its length is from 1ft. to 2ft., the head depressed, smooth, jaws equal, chin with one barbule, the gape large with small teeth above and below, eyes of moderate size, gill opening large, length of the head as compared with that of the body as one to four, the form of body cylindrical compressed posteriorly. The front dorsal fin is small and rounded; the second elongated, reaching nearly to the tail;

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both dorsal fins nearly uniform in height; ventral fins placed very forward, narrow, and pointed; pectoral fins large and rounded; the anal fin begins on a line behind the commencement of the second dorsal fin, but ends very nearly on the same plane; tail oval and slightly pointed. The fin rays are in number: dorsal 14, 68; pectoral 20 and 6; anal 67; caudal 36.

The colours of the fish are as follow: Body, yellowish brown, clouded and spotted with darker brown (and very freely); under parts lighter; lateral line is indistinct in the straight; scales small, and fins partaking of general colouring, those of the lower surface being the lightest.

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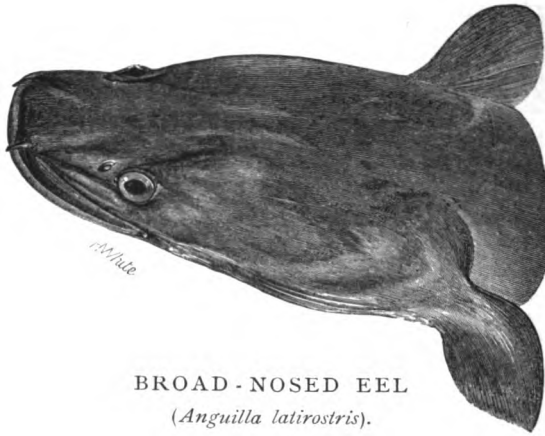
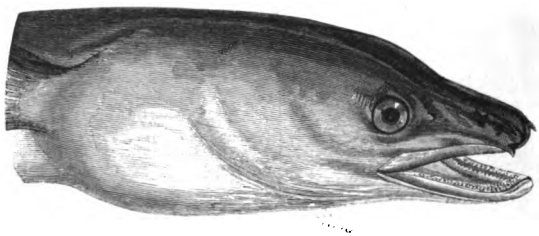
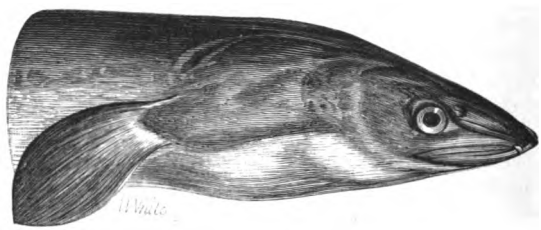


BROAD-NOSED EEL
(*Anguilla latirostris*).



SNIG (*Anguilla mediorostris*).



SHARPED-NOSED EEL (*Anguilla acutirostria*).

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CHAPTER XXXVIII.

THE EEL.

I CLAIM to know more about eels than about any other fresh-water fish. The reader may, therefore, accept what he finds in this chapter, so far as pure observation goes, without reservation. I have opened and thoroughly examined during the last ten years as many, probably more, eels than any other angler, except my father, in the kingdom. Hence I do not consider this little piece of introduction offensively egotistic.

Naturalists enumerate several species of fresh-water eel. Couch gives four distinct kinds—*Anguilla Hibernica* (the Irish), *Anguilla laterostris* (the broad-nosed), *Anguilla acuterostris* (the sharp-nosed), and the "snig;" and other writers increase the distinctions. Thames fishermen colloquially speak of the silver eel, the slug eel, the golden eel, the grig, and another kind which only travels down stream, and is distinguished by a strongly marked lateral line running from head to tail, as in the cyprinidæ. Some of these, however, are, in my opinion, unreliably separated by characteristics for the most part the result only of varying circumstances of existence. After long and careful examination, I have arrived at the conviction that the actually distinct species are three only —the *acuterostris*, the *laterostris*, and the *Hibernica*. The structure in each is slightly different, that of the first being more slender and the head more pointed than the second, the skin also being finer. These fish will be particularised further on. The "snig" or "grig" I look upon as only the smaller variety of the ordinary large eel of either sort. Monstrosities in structure occasionally occur. Plumridge, the fisherman, of Windsor, once showed me one with three distinct eyes, one each side, and one on the frontal bone. I may add that Yarrell gives accounts of the following eels: *A. acuterostris*, *A. laterostris*, *A. mediorostris*.

The form of the fish has created a widespread prejudice against it, and one rarely finds a Scotchman who takes kindly to it. This

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antipathy is probably owing to its serpentine form. There really is, however, little similarity between it and the snake, except in external form, the character of the skeleton and its internal important organs being totally different. The following may be said to technically describe the characteristics of the eel family:

The body much lengthened, and covered with a thick and soft skin, without the visible appearance of scales; openings of the gills small and simple, situated, as regards the pectoral fins, anteriorly beneath. The fins without firm or bony rays, and in the British species the dorsal and anal fins are united to the tail, thus forming a single fin; no ventral fin, on which account they are termed apodal fishes. Lateral line straight, when visible.

It may be observed, as bearing upon the anatomical characteristics of the eel, that—in view of the fact that in embryo fishes the ventral fins are the last to be developed—it might be supposed, from the absence of them in the eel, that this fish is especially low in the scale of organisation, and from the apparently undeveloped condition of the scales, such supposition would be strengthened. The skin is thick and tough, and, as noticed by Shakespeare, is occasionally in some countries used as a purse; in our own land it is frequently also made use of by ostlers, on account of its tenacity, for cleaning horse's bits and other metallic parts of harness, in preference to leather. This fact, and its slimy texture, in which the scales are so perfectly embedded as to give the idea that none exist, taken with the extreme tenacity of the skin of fishes well provided with scales, and undoubtedly true fish, have, as I say, militated against the position of this creature as a fish in the scale of creation. In the conger the scales are absolutely deficient; but, says Couch, "to obviate the conclusion that these opponent deficiencies of development are marks of a low condition of these creatures in the scale of nature, the far more important organisations of the brain and nervous system, and even of the muscles, are displayed in a higher degree than in a large proportion of other fishes, and in consequence the faculties of intelligence are in a corresponding degree of perfection." This is eminently apposite, and I can, from abundant observation, give testimony that next the carp the intelligence of the eel is first among fishes. The structure, indeed, of the brain—being of great length, with the lobes well back—as well as the high development of the sensory powers—lend aid to the opinion, were it not independent of such aid, by reason of actual evidence of sagacity in the fish.

Indeed, there is plentiful example of the taming of the eel. Aristotle has noticed how they are attracted by agreeable scents, and this I have verified, using in the experiment attar of roses in a minute quantity.

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Ellis, in his "Polynesian Researches," says, in reference to taming: "In Otaheite eels are great favourites, and are tamed and fed till they attain an enormous size. These pets are kept in large holes, two or three feet deep, partially filled with water. On the sides of these pits they generally remained, except when called by the person who fed them. I have been several times with the young chief, when he has sat down by the side of the hole and by giving a shrill sort of whistle has brought out an enormous eel, which has moved about the surface of the water and eaten with confidence out of its master's hand." A Mr. Walter C. Trevelyan also read a paper some years ago before the Wernerian Natural History Society of Edinburgh on the habits of some tame eels, excerpts from which may prove interesting. It seems that in a small pond in a watered garden at Crayd, the seat of David Carnegie, Esq., near Montrose, these eels had been kept for nine or ten years. They used to lie torpid during the winter, or occasionally on an extra warm day would come out in the sunshine, refusing food, however. On the 26th April in the year in question they rose for worms, but they ate sparingly until the warm weather began, when they became quite insatiable. One of them would then swallow twenty-five large worms one after the other. When they were first put into the pond and had no food they devoured one another. They generally lay quietly at the bottom of the pond, except when any of the family went to look into it, when they usually rose to the surface, sometimes for food, and at others merely to play with the hand or take the fingers into their mouths. When trying to cultivate the affections of eels myself I invariably found them very spiteful, and more than once I have got my finger bitten when trying to coax an eel by stroking its head, and the strength of the jaw of this fish is enormous, I can assure the reader.

The reference in the foregoing to the calling of eels by whistling reminds me that it is quite a question where the auditory apertures are. Mr. Pennell asserts the presence of such an aperture in the head, and I at first thought that the invariable presence of two sub-triangular openings in the fleshy part of the head, just at the junction of the spinal column, justified the assertion. But I read that the Rev. W. Houghton, F.L.S., on inserting a bristle in each of these orifices and clearing away the flesh, found each bristle to have traversed a closed-in tube in the skull, and to have come out just above the bone of the orbit. I find this is correct on careful experiment, and also that the tubes are very thin, and that each one terminates in a fold of membranous tissue just above the eye. The fold contained a thin fluid, like water. What purpose these apertures serve I leave to others to determine, but conjecture that as the optic nerve does not pass in its entirety to the optic lobe of the

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brain, sight, or some other faculty hitherto undiscovered, may be involved in this curious anatomical puzzle.

The eye of the eel, indeed, is a peculiarly interesting object under the microscope. It varies in a number of eels from light brown to almost a lavender grey. The iris is, of course, unexpanding, as in nearly all fish; the reason, probably, is that the diminished light is never too strong for the retina. It has, however, a fine granulated appearance of great beauty.

Paley ("Natural Theology") has the following paragraph anent the eye of the eel, which is, of course, strictly a physiological fact:

"In the eel, which has to work its head through sand and gravel, the roughest and hardest substances, there is placed before the eye, at some distance from it, a transparent horny convex case or covering, which, without obstructing the sight, defends the organ. To such an animal, could anything be more wanted or more useful?"

Again reverting to the skin of the eel, I may remark that the fish is encased in a most beautiful suit of scale armour, and now and then I have found it possessing iridescent hues of great beauty. The scales are of an oval figure, and when viewed under the microscope with polarised light, are exceedingly brilliant objects. The scales of fishes M. Agassiz divided into four orders, as stated on page 24, which he termed the placoid, ganoid, ctenoid, and cycloid. In the first two the scales are more or less coated with an enamel; in others they are of a horny nature. To the cycloid belong the herring, the eel, and the carp, and, indeed, most of our edible fish. Generally their scales are laminated and circular, but as to form those of the eel are exceptions. The occasional iridescence is caused by a finely-grooved structure, like that of the skin on the top of an infant's finger, as I have stated in the chapter on Grayling. Sir David Brewster ("Treatise on Optics") was the first to notice this. The iridescence of the pearl is also due to the same cause. Some of the most prismatic, obtained from a species "Mytilus," says Dr. Hogg, "consist of a beautiful purple-coloured series of concentric laminæ. That this iridescence is really due to the grooved surface was demonstrated by a Birmingham manufacturer, who cut grooves in steel at distances from $\frac{1}{500}$ to $\frac{1}{5000}$ of an inch, and produced the same effect in a superlative degree, originating a new manufacture of fancy articles in the shape of buttons, trinkets, &c."

Dr. Carpenter ("Cyclopædia of Anatomy") also refers to the common earshell (*Haliotus splendens*), and remarks, from certain experiments on its shell, that "the beautiful effects commonly called mother-o'-pearl are produced solely by the disposition of single membranous layers in folds or plaits lying more or less obliquely to the general

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surface." The scale of the eel in nearly every case presents evidence of this.

The barbs of this fish, like those of the carp, appear to be endowed with nerves of touch possessing the most exquisite power of feeling. In the tail, also, there is a network of blood vessels, which Yarrell has figured in his book, calling the appearance a "lymphatic heart." *Apropos* of this, it is only necessary to give a violent blow to the tail in order to kill the eel. This is one of two ways. The other and surest is to separate the brain from the spine by cutting immediately below that part which corresponds to the cerebellum of the human being.

In connection with this lymphatic heart, it may be here not out of place to give such particulars of this exceptional physiological phenomenon as I have been able to gather. In the "Naturalist's Library," edited by Sir W. Jardine, the following comprehensive details of such organs are given:

"In all living beings, besides the very necessary process of the ingestion and absorption of aliment, it is now very generally understood that there is a directly contrary, or, at all events, a very distinct operation going forward, whereby the effete matter of the system is unceasingly withdrawn and discharged from the body by a process which is designated 'absorption' and 'interstitial absorption,' and which is unremittingly operating in every part and tissue of the living frame. In invertebrate animals this function is discharged by the same machinery which moves the blood, whilst in the vertebrate an additional system is brought into play, known under the name of the 'lymphatic.' In fishes this system is exhibited in its simplest and most diffused form, these vessels being extensively distributed through the superficial and deep-seated parts of the body; they are also extremely distensible, and have no valves, as in the higher animals. In reptiles, although the general character of the system is much the same, yet the following peculiarity has recently been discovered by Professor Müller, namely, that pulsating dilatations of the lymphatic trunks very generally exist, and it is to these he has given the name of lymphatic hearts. The Berlin professor first discovered them in the frog, and subsequently in toads, salamanders, and lizards. In the first-named animal there are two pairs, one situate in the neck, subservient to the upper extremities, and the other, near the hip joint, to the lower. These last are placed immediately under the skin, and can be readily seen acting in the living animal, pouring their limpid contents into some continuous vein. Neither are they synchronous with each other on the two sides of the body, nor always performed in the same space of time; they are often irregular, and exhibit long and frequent intermissions. When in regular action they contract about ninety times in a minute.

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One of these hearts has been lately very accurately described by Professor E. H. Weber as occurring in a large species of serpent, the *Python vivitatus*; it is about nine lines in length and four in breadth; it has an external cellular coat and a thick muscular one; four muscular columns run across its cavity, which communicates with three lymphatic vessels, all of which have valves; the heart has also something like an auricular appendage. Dr. Hall's discovery was made near the tail of the eel, and was particularly observed under the microscope. If a young eel, six or seven inches in length, be rolled up in a strip of linen cloth, leaving out a portion only of the tail, it will remain quiet when placed on a long slip of glass, and the pulsation may be readily discovered to be wholly independent of the action or influence of the heart, and the number of beats will be seen to be more than double in the same period of time; they also continue after the heart—properly so called—has been removed. There can be no question that such an apparatus as this must greatly promote the important process of absorption, and although it may be supposed to be particularly desiderated in fishes and reptiles, Professor Müller expresses his conviction that important discoveries of a similar nature will ere long be made in the higher classes of animals."

It is characteristic also of the eel family that it has a peculiar kind of bladder. This is of large size and long, and in the middle of it is what may be termed a gland, covered with a network of bloodvessels, by the action of which the air is probably secreted into the sac or air bag.

On opening the eel from the throat the first thing that strikes the operator is the strong and eminently vigorous heart-action, which, even if all outside movement has long since ceased, is frequently to be observed performing its work some time after being exposed. Indeed, I have occasionally carefully taken it out and placed it in a glass of water, where it has continued its convulsive movement for twenty minutes or more, according to the temperature of the water and time the owner of it may have been out of the water before its extraction. It is situated just below the final folds of the gill branchiæ.

Before referring to the generative organs of the eel I must not omit to mention the parasites with which eels seem inveterately affected. On opening a 3lb. fish, November, '76, I perceived minute dark-coloured threads, or rather worms, adhering to the mucous membrane of the upper part of the ventral canal. These were in all stages of growth, from the eighth of an inch (at which length they were transparent) to half an inch in length, and about as thin as common sewing cotton. Whilst attached to the membrane they were active, immediately on being detached they died. I found them to be without a fully developed head, but with an

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arrangement rather resembling the umbilical vein connecting the fœtus of a mammal with the parent. The rupture of this produced death instantaneously.

Of ten eels subsequently opened for the purpose of detecting and observing these creatures, I found five fully furnished with them as before—no larger, and in all stages of growth. In each case the eel itself was eminently fat and well-fed, and each was of the sharp-nosed species. Whether they are at all to be met with in the broad-nosed and other species I cannot say, but I have never come across them. I cannot, either, tell the reader what particular parasite this can be, never having before observed it in any fish. That the creature is curious, and moreover plentiful, does not, however, admit of doubt.

At this juncture I am reminded of the parasitic growths to be found independently and in different positions to the above animalculæ of the eel. The entozoic stage of the human tapeworm is frequently found in eels obtained from situations such as Cumberland Lake (Windsor Great Park), into which the effluent of the sewage farm contiguous continuously falls. I had in my possession a worm—apparently headless—taken from an eel, which measured 7in. on being taken from the fish. However, this is an extraordinary length in the eel, but the lesser size is compensated by the number, which will amount, in exceptional cases, to fifty. This I have repeatedly remarked. An accurate catalogue and description of all the aquatic living parasites which from time to time have come under my notice as denizens of this fish would require a separate chapter, and must not be here given; but I cannot leave this part of the subject without reverting to a more than usually interesting insect which was taken from the entrail of an eel and lived two months in captivity. It turned out to be the larvæ of the gnat *tipula crystallina*, but how it continued to live like a second Jonah is to me a mystery. Normally it was nearly transparent, and ¼in. in length, with two small spots towards head and tail, looking like air-bubbles. Placed at its posterior end, and forming a powerful rudder, was attached a fan-like tail, resembling exactly a fan made of swan-quill pens—some twenty-three, or thereabouts. Its head terminated in a hook, at first sight resembling the lower anserine jaw of the pike. It is figured in Lardner's little work on the Microscope.

Eels are subject to a kind of scarlet fever, so called because it turns the fins and the lower part of the body to a light scarlet hue. I think Mr. Buckland has somewhere diagnosed this disorder, but cannot find where. Mr. Pennell, however, quoting from the *Leinster Express*, throws some light on its character. He says: "During the present season, both eels and pike have frequently been found in a dying state on the surface of the

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water. They seem emaciated, and the inside of the mouth presents a funguous ulceration covering the teeth, palate, and tongue, and when the body is opened the stomach is filled with a green slimy substance. Eels are seen with little apparent life for a day or so, and afterwards dead in shoal water (the place where all wounded or sick fish swim to), the under part of the body, from the mouth to the tail, is speckled with blood-red spots, and the mouth is sometimes filled full of coagulated blood. However, the fish does not seem to be in bad condition or to have suffered so long as the pike; the same kinds of fish in the canal about Monaster-Evan have also suffered from the same malady." The cause of this is yet unknown; I should be inclined to fancy it lay in the contamination of the water.

And this reminds me of a curious characteristic of the flesh of the living eel. It is well known that fish are capable of absorbing to a great extent both the odour and flavour of any strong tasting and smelling essence capable of minute division—not solution—in water. Thus a tincture of lavender, aniseed, caraways, or cloves, regulated with a certain quantity of pure water, transmits its flavour to the fish placed therein without being the immediate cause of any discomfort to the live fish. In the eel this faculty is extraordinarily developed. A medical friend of mine detected the presence of belladonna, opium, strychnia, sulphate of quinine, and other strong drugs in the flesh of eels prepared by myself in the manner indicated; whilst its colour was strongly varied by the introduction of indigo, cochineal, and madder. How far disease may be transmitted by the eel is uncertain, but I entertain the opinion that considerable injury is annually received by eel eaters from the consumption of fish which have remained in contiguity with dead or corrupt matter for any length of time—such as sewage, dye, refuse, or fetid mud laden with marsh gas (sulphuretted hydrogen).

It may now be opportune to turn to that very vexed question—though question it really now no longer is—as to the generation of eels.

First, as to the sexual organ. What says Dr. Mitchell? "The roes or ovaria of eels may be seen by those who will look for them in the proper season, like those of other fishes." And this is true. Jesse, who devoted a lot of time to the elucidation of the problem, thus describes the organ:

"The sexual organ consists of two long narrow sacs, extending one on each side of the air bladder throughout the whole length of the abdominal cavity, and continued two inches posterior to the vent. The membranes forming this tubular sac, secreting on the inner surface the milt of the male, and affording attachment for the ova in the female, are puckered or gathered along the line of junction to the peritoneal covering

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of the spine, and the free or loose floating edge is therefore thrown into creases or plaits like a frill.

"It is probably from this folded or convoluted appearance the sexual organs of the eel have frequently been called fringes. By the kindness of my friends Mr. Clift and Mr. Owen, of the Royal College of Surgeons, I have had the pleasnre of seeing some drawings belonging to the collection of John Hunter, in which these peculiarities of the sexual organs in the eel are beautifully exhibited in various magnified representations." The representations, unfortunately, do not now exist.

Adding a seal, as it were, to this decisively expressed dictum, Couch says also: "The error was caused by expecting to find in their (the eels) bodies a close resemblance of the milt and the roe of most other fishes, to which, however, their organs of propagation bear in some particulars but a distant likeness." He goes on to describe the organs and their position in a manner almost identical with that of Jesse—it need not therefore be repeated here—and adds: "That the small grains embedded within their soft and greasy covering are truly the spawn of the fish, is proved by the examination I have been enabled to make, as also by the inquiries of other observers. Thus, a portion of this roe was placed under a microscope, when there were distinguished a large number of globular grains, some of which, according to the notes then made, 'were a hundred times larger than others, from whence the conclusion is that some are approaching maturity, and that their exclusion is in succession,' a fact rendered certain by repeated observation. It is added, it is impossible to imagine that all these could have been hatched within the body, and still less without the circumstance having been long since ascertained. The small size of the orifice of egress is also a proof of the same thing."

The same observer goes on to clinch the matter by quoting the communication of his son, R. G. Couch, to the *Zoologist*, 1847, page 1830: "Last summer I took a quantity of mud from a spot much frequented by eels, and carefully examined it to see if there were any ova in it; and after testing several specimens without success, I was at least gratified by observing the eels, small and transparent, lying on the surface almost motionless. They rapidly grew, and in ten days acquired strength and size to swim about."

Of the verity of these conclusions I have not the slightest particle of doubt, and my readers may rest assured that they are correct. I have proved them. The magnificent opportunities which the lakes of Windsor Great Park afforded me during nearly two years for observation were sufficient to enable me to examine the spawn and milt of eels repeatedly,

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and to gather up hatched fry for microscopical examination from waters far above the level of the adjoining land, where egress meant impossibility of return.

But it is very amusing to notice the quaint and absurd opinions of some of the olden writers on this subject. "Oppian," says learned Dr. Badham, "supposes an embrace of the sexes actually to take place, after which a strigimentum or gluey exudation from the surface of the body detaches itself and falls to the bottom, where it is vitalised, not by the co-operation of any apocryphal mud nymph—some

> Young Lutetia, softer than the down,
> Nigrina black, or Merdamente brown,

—but by an intra-uterine action of the mud itself; for what," asks Oppian, "is so engendering as mud?" Aristotle confesses to a similar opinion, and calls eels "the solitary race that have neither seed nor offspring." Pliny thought that they rubbed themselves against the rocks after they were tired of living, and from the detritus issued a new breed. Others thought, like Virgil's bees, that eels came from the carcases of animals; others that the soaking of a stallion's tail would infallibly breed eels. ("Might not," asks Dr. Badham, "such a popular superstition of hair passing into snakes have originated the singular tresses of Medusa?")

Finally, according to the same authority, some ancient naturalists, finding the terrestrial origin of eels obscure, had recourse to the skies, and attributed this multitudinous race to Jupiter and a white-armed goddess named Anguilla. Accordingly, Archestratus in his description of an Attic feast, introduces Anguilla boasting of her Jove-sprung offspring. Van Helmont in much later times believed that they came from May-dew, and might be obtained by the following process: "Cut up two turfs covered with May-dew, and lay one upon the other, the grassy sides inwards, and thus expose them to the heat of the sun; in a few hours there will spring from them an infinite quantity of eels."

Other writers have searched and discovered the young eels in strange parts of the parent. Leuewenhock found them in the urinary, and Vallisnieri in the swim bladder, whilst others have extracted them from the intestinal canal. Old an angler and observant as Heath, of Wraysbury, is, he once assured me that he had exuded young eels from the excremental vent.

All this is absurd enough. But what shall be said of Rondelet who professes to have *seen* eels embrace each other as serpents do. (By-the-bye, the same eyes saw a lamprey stop a cardinal's ship in full sail.) A host of other curious and funny opinions and assertions could

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be given, but they would serve no useful purpose. The sum total of the matter is, that *they spawn like other fish*.

And that they will spawn in inland waters, both Couch and Yarrell, as well as other lesser observers, including myself, agree. I think they prefer, however, to visit brackish water for the purpose, if possible. A gentleman once mentioned as within his own knowledge that tiny eels were seen coming up through the sand of a stream near Ravensbourne, and the Rev. W. Houghton confirms this in a paper, written years ago, in the "Quarterly Review," in which he mentions a place on the River Shin, where he found it alive "with young eels, some of them scarcely hatched, at the depth of five to fifteen inches." It will be seen that these instances corroborate Mr. Couch, junior, very materially. Mr. Buckland says he once found some young eels hatching out. This was on the rocks near the entrance of the harbour at Galway.

It is very clear that, if it be possible, eels prefer to spawn in the brackish water of the sea. At the part of a river where the fresh passes into the salt water, the salt water, from its greater specific gravity, flows beneath the former; and there it is that the young eels are sent to mount from below and seek to pass up stream. In some rivers they assume the character of a dense mass of wriggling, struggling, tiny eels, often of a considerable length, breadth, and depth. On the Severn and Thames this upward migration of eels is termed eel *fare*—the Saxon word *fare* meaning to go, to pass, to traverse. On the former river, according to Daniel, in "Rural Sports," "The elvers (or eelets) taken in the Severn about April are supposed to be the fry of the conger eels; they quite swarm during their season, and are taken in a kind of sieve made of hair cloth fixed to a long pole; the fisherman standing on the edge of the water during the tide puts in his net as far as he can reach, and drawing it out again takes multitudes at every sweep, and will collect as many during one tide as will fill a bushel; they are esteemed very delicate." They are not conger fry, as Daniel intimates, however.

In the Thames they are no longer seen in such masses. When Yarrell wrote, and within the recollection of many fishermen of my acquaintance, the numbers of these little eels were immense. Some idea may be gathered of the quantity when it is stated that in 1832 as many as from 1600 to 1800 of these fish had been seen to pass a given spot in a minute of time. How they were counted Yarrell does not say. It is certainly impossible for any person to count eighteen hundred in a minute. Anyhow the number is, I know, a probable one. These eelets, or elvers, are very light coloured in spring, but become of a greenish brown by July or August.

It has been a matter of remark with what persistency these little

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creatures will surmount obstacles. On the Colne I am informed they have been seen surmounting mill dams by means of an iron chain hanging over into the water slantwise. Couch says twenty feet have been known to be passed over. He also says: "A curious instance of the means which young eels will have recourse to in order to accomplish their migrations is annually proved in the neighbourhood of Bristol. Near that city there is a large pond, immediately joining which is a stream; on the bank between these two waters a large tree grows, the branches of which hang into the pond; by means of these branches the young eels climb up into the tree, and from thence let themselves drop into the stream below. A friend of mine who was a casual witness of this circumstance informed me that the tree appeared to be quite alive with these little animals. The rapid and unsteady motion of the boughs did not seem to impede their progress." After this the sight of an oyster walking up-stairs, so usually considered an impossibility, may be looked for.

From the migratory movement upwards of the young eels, eelets, or elvers to the migratory and much disputed movements of their adult relations is but a short transition. I have, therefore, purposed discussing this latter subject with a view of again settling discordant opinions.

The personal habits of this fish are mysterious. Its nocturnal, equinoctial wanderings, its quiescence during day and insidious meanderings during the darkness of even winter nights, make difficult the observations necessary for a complete knowledge of its habits. The annual migration of the eel as the land floods rise and winter approaches is of course well known, and by many is described as a realisation of a natural instinct to seek the salt water for spawning purposes. In any case, however, the following seems to be the nearest realization of the truth.

According to Dr. Roots, of Kingston, who contributed some shrewd and truthful remarks on the subject to Jesse's "Gleanings in Natural History," most writers agree that in the case of adults there are two migrations each year. One downward, as before indicated, for the purpose of spawning, if possible, in brackish water; and the other a return for the reverse purpose to the salmon of obtaining food and fitting itself in fresh water for the consequent spawning of the autumn. Mr. Pennell says: "Whether the process of spawning requires such a change or simply because it is agreeable to these eelets is not quite certain." Now, I will offer one remark on this. The reader may be sure that amongst fishes that which is agreeable to them and becomes a habit, eventually becomes a necessity. There is no mental range which will allow of the conquering by an effort of will of circumstances which appeal only to the sensory powers, as there is in human beings. It is, therefore, absurd

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to speak of creatures of such low organisation doing things which are simply *agreeable* and not necessary. Hence, if eels migrate, as I believe they do, twice a year, it is *necessary* for them so to do, in order that the highest development of the type may be induced and retained. My own conviction, from circumstances which have come to my knowledge, is, that if eels be left in a circumscribed area of fresh water throughout a large number of years without fresh introductions, notwithstanding their power to breed therein, eventually the departure from their inherited instinct of migration, weakens, and finally quells, the reproductive powers, and the race becomes extinct with the death of the last pair.

But the assertion has been made by Mr. Pinkerton—no mean authority—that only one species of eel migrates, in the following words: "The grand distinction between the two species (the sharped-nosed and broad-nosed eel) is that the sharp-nosed species is a migratory fish, while the broad-nosed one is not. I admit that the latter has its summer and winter quarters—for eels are very susceptible of cold and electricity—and it wanders a good deal at night in search of prey, but it does not migrate to the sea in large shoals, as the sharp-nosed species annually does . . . I have frequently visited the great eel fishing at Toone, on the Lower Bann, where from fifty to sixty tons are annually caught in the migrating season. As many as 70,000 eels have been taken at this place in one night, all of the *sharp-nosed species*, with the slight exception of, perhaps, a dozen broad-noses that have been accidentally mixed up with the shoal—the exception thus confirming the rule." He goes on to say, that on the night he visited the fishery, some 11,000 were taken, and the people to whom they were sold would only take the sharp-nosed variety. With the dexterity of eye and hand worthy of a Robin or a Frikel, these were selected by the counters, and only twelve "broad-nosed" fish were found in the whole lot.

Now this evidence is apparently too conclusive to resist, were it not for one trifling fact. In Windsor Great Park there is a lake of some forty acres, which formerly possessed an enormous stock of eels, ranging from 1lb. to 5lb. Of course the autumn floods roused these eels up every year, and occasionally a hundredweight passed into the eel trap during the night in their migrating voyage down stream. *Out of the whole lot a percentage of at least nine-tenths were broad-nosed eels.* This I can state on my own observation.

Mr. Pinkerton's instance in such case does not remain so impregnable as before, and I would submit in addition the possibility of the particular fishery to which he refers being possessed of only the sharp-nosed variety of eel. It is a well-known fact, that the broad-nosed is a grosser

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feeder, and its habits are much different to the other species. Hence it is conceivable that the habits of one might not be suitable to the other.

My own deliberate opinion is, that adult eels pass on where possible, as in the Thames, to the brackish water and there spawn; if such a migration be not possible, or the season being unremittingly cold does not warrant the fish in facing its inclemencies, the said eel remains until its ova is matured for shedding, which it does in the covert it has selected. More than one is always found in a particular locality, and thus sexual impregnation may be effected. Should the season, however, be opportune, they glide on the warm floods, and enter the sea, *never to return* on the Thames unfortunately. The elders, however, return, if not in immense clusters, yet singly and in reduced assemblages. Their climbing powers are well known, and I have frequently seen illustrations of it. Having reached the upper parts of the river, they feed ravenously, and grow as they go. The spawning power may be retarded in its developement, for aught I know, until a certain size or age be attained, and it is possible that certain portions of ova may be shed on the passage down, seeing that it matures successively.

During the sultry nights of summer eels are very lively, and this liveliness is especially marked during thundery weather. Strangely enough, I find Shakespeare also notices this ("Pericles, Prince of Tyre," act iv., sc. 3): "*Boult:* I warrant you, mistress, thunder shall not so awake the beds of eels as my giving out her beauty," &c. It is, therefore, certain that the "immortal bard" had noticed the effect of the atmospheric tumult on this fish, as he noticed everything else, correctly. On such occasions it is said in certain parts of England that the eel emits some sort of sound. This is said to resemble a soft moan, occasionally emanating from lakes in which eels abound, especially when a storm is pending. To this, however, I should not have called attention but for the fact that a very experienced traveller assures me that he is inclined to accept the opinion, rife among sailors, that the sea eel actually emits sounds of a similar nature. Be this as it may, it is certain that in the days of old Rome the murænas, or sea eels, were supposed to have a regular language—"low and sweet," says an ancient writer, "and with an intonation so fascinating that few could resist its influence"; and it is also said that the Emperor Augustus even pretended to understand their words.

Of course, that some fish really have the power of emitting sounds is undeniable; witness the "croaking" trout of Clarracwdydy pools.

As to eels travelling over land, that is, I believe, very well established. A friend (whose name for obvious reasons I suppress, but whose veracity

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is above suspicion) assures me that a portion of his lawn forms an isthmus separating two lakes which have no water connection, and that he has set a net repeatedly on this strip of land during summer, and thus captured eels of respectable size and weight on the dry land. Perhaps in confirmation of this I may be allowed to cite the example given by Dr. Hastings, the learned natural historian, of Worcestershire. He says: "A relative of the late Mr. Perrott was out in his park with his keeper, near a large piece of water, on a very beautiful evening, when the keeper drew his attention to a fine eel quietly ascending the bank of the pool, and with an undulating motion making its way through the long grass. On further observation he perceived a considerable number of eels quietly proceeding to a range of stews nearly the distance of a quarter of a mile from the larger piece of water from whence they started." How the eels got informed of the other pieces of water is undiscoverable, but that they do know in what direction the water lies I can safely affirm, and anyone may prove it for himself by placing an eel in the grass of a field, say a quarter of a mile from the nearest pool or stream of water. It will, after a few wriggles, point its head and attempt its way thither without fail.

Besides this corroboration of my view that they intelligently vacate their present quarters for others more to their liking, whether such lie overland or not, there is a whole mass of testimony afforded by other writers, some of which exhibits details of an exceedingly curious nature. Thus, in Patterson's "Zoology," he relates that the Irish fishermen are wise enough to provide haybands for the assistance of such eels as desire to climb over the rocks to other waters. Daniels says they fish with a kind of straw rope, into which the eels get entangled, and are thus drawn ashore. Couch says that within his own observation, when a leaden pipe which conveyed water from the roof of a house to a cistern 15ft. from the ground became obstructed, and in consequence a portion of it was cut off, the pressure of the water on the upper part was seen to thrust out, head foremost, three eels, each 22in. in length, and no two of which were able to pass each other in the tube. Various instances of a similar character are also related by Thompson, in his "History of Ireland."

The part in which this power of vermicular wandering chiefly lies is the tail. It is an especially curious sight to see an eel escaping from confinement, by means of this part of its anatomy. I recollect a most ludicrous instance of this taking place some years ago, whilst I was transporting some large eels a considerable distance by rail. It was winter time, and knowing the fish would travel perfectly well in damp moss, I packed three in a spacious hamper, enveloping them with sphagnum moss

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well damped, not, of course, dreaming they would consider their quarters too confined for one moment, or that they could, if they tried, escape between the closed wicker work. As luck would have it, the guard's van being very full, I agreed to place the hamper under the seat of the carriage. This I did opposite me, as, being the only occupant, I could give a glance occasionally at them. At one of the stations an old gentleman of my acquaintance got in, and we instantly fell into conversation; and when a young lady at another time came in and sat on the seat under which the eels were, I did not think to remove them. All of a sudden, after we had started and were going at some thirty miles an hour, the lady screamed, and declared someone was under the seat grasping her ankle. Sure enough, one of the largest eels had protruded its tail and half its body, and had firmly coiled itself around our fair neighbour's ankle, much to her fright, and, sooth to say—ungallant as it may seem—our infinite amusement. The matter was, however, soon cleared up, and the whole incident ended in a hearty laugh.

Tenacity of life is also a characteristic which undoubtedly aids the eel in such peregrinations; but woe to him if excessive cold should unexpectedly set in. Mr. Buckland, in "Curiosities of Natural History," mentions an immense advent of congers to the water's surface, dead, dying, or seriously indisposed, caused by excessive frigidity of the water into which they had penetrated. It is also recorded that no less than 1,800,000 kilogrammes' weight of eels perished through cold in one winter in the marshes of Commachio.

Indeed, that extremes of temperature are inimical to the well-being of the eel is abundantly proveable. Even Aristotle remarks on the extreme sensibility of the fish to any great or sudden change of temperature, and, writing for his own countrymen, he warns them of the dangers attending their removal from ponds in summer; he recommends, therefore, that eel ponds be stocked in winter. In modern times, however, it appears that cold, as before intimated, is the most disliked by eels. Gesner, in the "Annals of Augsberg," says that "one hard winter, when all the pond fish in this locality were frozen or suffocated under the ice, the eels escaped to land, and, getting into some ricks, were found embedded in the hay quite dead." In any case, it is clear that extremely cold climates do not agree with them. There are no eels in the Arctic regions, nor Siberia, nor in the Russian Volga, nor are some of the more northern parts of the Danube productive of them.

Yet extreme cold does not seem to kill eels in all cases. Its first effects seem to be to deaden their appetites, and they then seek to bury themselves in the more equable, if cold, mud of the bottom of the water. During the period they thus remain in a state of torpidity the respiration

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is very low. Dr. Marshall Hall has shown that the quantity of respiration is inversely as the degree of irritability. With a high degree of irritability and low respiration co-exist: 1st, the power of enduring the deprivation of air and food; 2nd, a low animal temperature; 3rd, little activity; 4th, great tenacity of life. All these peculiarities eels are well known to possess. The high degree of irritability of the muscular fibre explains the restless motion of eels during thunderstorms, and helps to account for the enormous captures made in some rivers by the use of gratings, boxes, and eel-pots or baskets, which imprison all that enter. The power of enduring the effects of a low temperature is shown by the fact that eels exposed on the ground till frozen, then buried in snow, and at the end of four days put into water, and so thawed slowly, have discovered gradually signs of life, and soon perfectly recovered.

Though this is undeniably true and reliable, the experiments of John Hunter have placed the history of eels in this respect in a still more satisfactory light. With a properly constructed thermometer he found that the temperature of the stomach of a particular eel was 37 deg. He then placed the eel in a mixture, which he first ascertained to be at 10 deg., and this brought the temperature of the stomach down to 31 deg.; the creature appeared to be dead, yet on the following day it was restored to full life and activity.

This accomplished physiologist further noticed that the presence of life allowed the vital heat to be lowered to two or three degrees below freezing point, and after this it resisted all further decrease, and when the power of life had become expanded by the exertion of thus resisting decrease the creature became frozen like any other dead matter.

It further appears by experiment that an eel, like the frog, can digest its food when the heat is 60 deg., and loses this power when it is below 40 deg.

This brings us to the food of the eel, which is an extensive subject. Albertus Magnus stated that its food was entirely vegetable, but in the last session of the Rhenish and Westphalian Natural History Society, O. Melsheimer, reporting the results of experiments on eels through a long series of years, entirely refutes this, and, on the contrary, proves the food to be exclusively animal. He also mentions that it seems to be extremely fond of the river lamprey (*Petromyzon fluviatilis*). My own observation coincides with this. Out of many hundreds of eels whose stomachs I have examined, I have never found vegetable matter except in such positions as to clearly indicate its having been taken inadvertently and involuntarily—such, for instance, as when the contents of the stomach of a smaller fish swallowed as food has been laid bare and its vegetable nature revealed by the processes of digestion.

Couch, however, says eels have been seen to devour the leaves of

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cress. I imagine that if this be the case it is for some such reason as that which prompts a dog to eat grass. He, however, goes on to say that animal food is chiefly its sustenance. This, I add, must be clean and fresh. *Par parenthèse*, however, it may be remarked that the broad-nosed eel will, to my certain knowledge, when pressed with hunger, eat almost any carrion. Couch adds that the water hen, and in several instances a rat, have been found in the stomach of an eel, and on examining one that was found floating on the river Tamar, a snake, only a little less than the eel itself, was found in its stomach. Yarrell remarks that they will eat the fins off carp. I don't know of an instance myself where the "fresh water fox" was foolish enough to allow it, but, doubtless, this careful author had some grounds for his remark. I have seen an eel with its stomach so distended by a large frog, that it looked, as Josh Billings comically says about snakes under similar circumstances, like "a young pup with two quarts of milk knocked into it by mistake."

The principal natural food of eels, however, seems to be, first, all the water worms which abound in our rivers and lakes, especially those of the *nais* species, which are of a bright scarlet hue, and most beautiful microscopical objects. Next I am persuaded the crustacea are the most affected by the anguilla. Comprised in this generic title are, of course, all Entomostraca, amongst whom the "water fleas," especially the *Cyclops quadricornis*, are first favourites. The eel, like the trout, will also thrive eminently where there are plenty of the *Pulex gammari*, or water shrimps.

Besides the well-known food of these fish, such as worms, &c., it is by no means certain that human flesh is not caviare to them. It is recorded that in the palmy days of epicurean Rome certain fastidious gourmands would eat no eels that were not fattened on the flesh of men, *i.e.*, refractory slaves or condemned malefactors; also who does not recollect the witty stanza from the "Knight and the Lady" ("Ingoldsby Legends") ?

And when she "comes to," oh, 'tis shocking to view
The sight which the corpse reveals!
Sir Thomas' body. It looked so odd—he
Was half eaten up by the eels.
His waistcoat and hose, and the rest of his clothes
Were all gnawed through and through;
And out of each shoe an eel they drew,
And from each of his pockets they pulled out two!

. . . . . .

And she said with a pensive air,

. . . . . .

Eels a many I've ate; but any
So good ne'er tasted before!—
They're a fish too of which I'm remarkably fond,
Go—pop Sir Thomas again in the pond,
Poor dear!—he'll catch us some more.

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In reference to the remark anent man-fatted eels for Roman gourmands, I ought properly to say that the record referred to speaks of the sea eel, or *muræna*, not our own comparatively inoffensive anguilla. Vedius Pollio, according to Badham, is indissolubly connected with this eel in name. Pliny informs us that this person was a follower and prime favourite of Augustus, who devised a variety of cruel experiments by means of this fish, causing offending slaves to be thrown into stews in which the fish were kept, that they might be torn or nibbled up, "not," as his quaint translator, Dr. Holland, says, "that there were not wilde beastes ynow upon lande for this feate, but because he took pleasure to beholde a man torne and plucket in pieces all at once, which pleasant sight he could not see upon any other beastes upon lande." But there are variations of this story, and the most picturesque is that the tyrant imposed on any servant who broke decanters (*fregit crystallinum*) *et hoc, &c.*—the death by fishes. On one occasion, when a grand banquet was being given to Augustus, the slave appointed to wait on this august personage inadvertently smashed something. Knowing his doom, he did not wait till the emperor had departed, but, rushing into the room, prostrated himself before the emperor, and confessing his carelessness or awkwardness, begged for a different death. He "did not care to die, but thought it hard for a man, even though a slave, to be made *esca piscinæ*—the live bait of fish." Augustus, with some severity, it must be said, not only set the suppliant free, but ordered all the ponds to be filled up and all his entertainer's stock of glass to be instantly smashed in the presence of the assembled guests (*crystallina ante omnia coram se frangi jussit complerique piscinum—Seneca De Ira*).

Dr. Badham observes that Vedius Pollio was not the only person who entertained fish on his own kind. Mopsus, the Lydian, gave Queen Gadis and her son up to the scaly community of Lake Ascalon; and Crena, Agamemnon's mother, was, for her misconduct, also given by her own father to the deep for the benefit of sharks and murænas.

So much for the food of the eel tribe.

The eel is distributed almost all over the world. An able naturalist, Mr. Lane, speaks of them as being the only fresh-water fish of Madeira, where, it is said, they abound in water 500ft. above the level of the sea. Greenland is said to possess them by Fabricius, but whether this is correct or not I cannot say. They are also to be found in Japan and parts of China, as I have been informed by a member of the Chinese Embassy now in London, and they are especially plentiful in the countries bounding the north and east of the Mediterranean. In Hungary they are found in large numbers in lakes and ponds. Narbonne and Mont-

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pellier, in France, rank high in the size of their eels, and the Seine swarms with them at certain parts. In the Elbe they occur of very large size, and in the Ganges they attain a much more considerable length and weight. Altogether, it may be safely said that no fish has enjoyed so wide a celebrity or has retained it so long as the eel.

The growth of eels is said by some writers to be very slow. Yarrell says they do not exceed twelve inches during the first year, and characterises this as "slow." I cannot agree that it is tardy in comparison with other fishes. Lacepede opined that its growth was very gradual, and that many years elapsed before eels were of the size at which they are usually found, but he also believed that their limit of age was not less than a hundred years. In aid of this opinion he mentions the case of a friend who put sixty of these fish in a tank. They were of very small size. After nine years they had only increased from nineteen centimètres to twenty-six. This sort of experience has been contradicted by the experiments of Mr. Coote (the father of pisciculture), who placed young eels in a reservoir with a sufficient supply of food, and in four or five years they attained the weight of from four to five pounds. Daniel gives an instance of an eel which lived thirty-one years in a well, but I cannot endorse his supposition that eels grow so rapidly as he describes in Lough Neagh. He says that in this lake they have grown from the size of pack-thread to that of a man's leg in from three to four months. Couch says that his observation leads him to believe that the very young ones that have gone upwards in the spring, at their return in the autumn are larger than a swan-quill, and in some cases even as large as the little finger of a child. My own belief is that an eel of the ordinary "eel fare" dimensions grows, with a plenitude of food, to the length of eight or nine inches in a full year. I have proved this in an aquarium.

The size to which fresh-water eels ultimately attain is in some cases enormous. The average size is, perhaps, not more than 2½lb., if so much; but instances are on record where the size has almost provoked one to believe that the conger has been mistaken for the fresh-water eel. Mr. Buckland recently exhibited the cast of a fine eel from the Mole of 11lb.; this was of the sharp-nosed species, and a magnificent fish it was, and he gives a most interesting account, in his "Familiar History of British Fishes," of the eels that have come under his notice. He says that in November, 1867, an eel of immense size was shown at Mr. Culham's, fishmonger, of Downham Market, Norfolk, which was taken out of the river Ouse, near Denver Sluice. It measured in length 5ft. 8in., its girth was 17½in., and it weighed 36lb. (28lb. after being cleaned). Its subsequent history is as follows: The eel was sold and taken to Ely,

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Cambridgeshire; it was exhibited there, skinned, and the flesh sold, the skin was preserved. I regret to add that Mr. Buckland, in a foot note, cannot help thinking that the fish was a conger.

He goes on, however, to state that eels, of which there can be no doubt as to species, were taken at Tewkesbury, 7½lb.; at Graypak, Petworth, 5lb.; in the Arun one of 9lb.; in one of the Norfolk Broads one of 7lb.; near New Mills, Norwich, one of 7½lb.; another on the 13th January, 1869, 8½lb. at the very same spot. I myself saw one which probably had escaped from Virginia Water, and which was taken at Staines, of 8lb. weight. These weights seem to me the maxima of those to which English eels attain in these degenerate modern days.

Badham, in "Prose Halcutics," however, refers to some continental monsters of the eel family. He speaks of France, Narbonne, and Montpellier, as ranking high on account of the bigness of their eels. Aldrovandus speaks also of some weighing 20lb., and Rondelet records others from the same locality of four cubits long and as thick as a man's arm. Badham further says that the Seine, near Elbœuf, swarms with them. "In Prussia they attain occasionally a length of 12ft., in the Elbe specimens occur of 60lb. weight, and in the Ganges orientals stretch to upwards of 30ft." We cannot doubt Yarrell when he says: "I saw at Cambridge the preserved skins of two which weighed together 50lb.—the heaviest 27lb., the second 23lb. They were taken on draining a fendyke at Wisbech. No other fish of any sort were found in that dyke." There is, however, considerable suspicion in my mind that the specimens were congers naturalised.

The enemies of eels are not very many. Pike and salmon are fond of them as bait, others also are very partial to this fish, and the barn rat is also, I know, an obtrusive friend as it also is to roach. (See Chapter XIV.) Mr. Pennell gives a remarkable instance, as detailed by a Mr. Hardy, of this rodent's partiality. "In February last" says Mr. Hardy, "when walking by the side of the Mill Race at Swalwell, near Newcastle-upon-Tyne, we noticed a common house rat making its way close by the edge of the water among the coarse stones that form the embankment. Curious to know what it could be doing there, we noticed its progress downwards until it reached the outlet of a drain, into which it had just turned, when it gave a sudden plunge and as quickly reappeared in the stream with a middling-sized eel in its mouth. It made for the edge, where it soon regained its footing, a matter, owing to the steepness of the bank, of some difficulty, increased by the struggles of the eel which it had seized a little below the tail, and which was exciting itself vigorously to get free. The rat attempted to run forward and turn a corner, where on a broader edge it might, perhaps, have luck in its fishing; but the desperate

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efforts of the eel rendered his footing so precarious that rather than have a second ducking he was reluctantly obliged to drop it into the water." Mr. Pennell also quotes another example which clearly shows that animals of this species have a strong predilection for fish. A Mr. Banister regrets finding that polecats are also fond of eels. His report is to be found in the *Zoologist* for 1846. He observes: "We have polecats abundant in Pilling during the whole year, and in the winter season, when the water in the ditches and the main drains is chiefly congealed, and more especially when the ice is covered with snow, the footprints of the polecats may be traced on the ice, and the most indubitable evidence is thus offered of its predilection for fish. Under such circumstances I have repeatedly ascertained that this animal is a most expert fisherman, for in severe and long continued frosts many eels ascend out of open drains, and, as these watercourses are most slightly frozen over near the springs, the polecats, either by instinct or otherwise, discover the retreat of the eels. In tracing the footprints of the polecat, it will soon be ascertained that he halts at every hole or opening he meets in the ice, and at once commences fishing by introducing a forefoot into the water, and no doubt groping all round under the ice as far as he can reach in search of such eels as may come to the aperture for air. That he uses his forepaws in this manner is distinctly proved by his dirty footmarks afterwards in the snow." As eels are often to be seen coming to the surface of the water at any aperture for air when the water is frozen, this incident may be credited to the full. Herons are also fond of eels, but the battle is not always to the strong. Couch mentions that more than one instance is known in which, while its fearful bill has pierced the body of its prey, the agony of the fish has caused it to twine itself round the neck of its foe and hinder its flight or cause its death. This author also remarks that—"A contest between a cormorant and an eel for life and victory is not a little interesting, and the more so as an active eel is not easily persuaded to pass into or remain in the capacious stomach of its foe. A cormorant was seen with its throat and neck much distended; but observing that itself was closely watched, it endeavoured to get to a distance, in doing which its efforts to retain or swallow the prize appear to have become relaxed, which the eel seized the advantage of and escaped from its jaws with great activity. The bird immediately dived after it and brought the captive to the surface, but experience had taught the lesson that something further was needed before another attempt should be made to gulp down its prey. Violent and repeated pecks were made by the powerful bill along the length of the fish, and then, supposing it to be sufficiently disabled, it was taken up and held across the mouth

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as if to be swallowed." This appears to have been again and again repeated until all movement ceased.

Of course Badham has something quaint to say in reference to this tenacity of life and purpose in the eel. This is what he does say: "Glover quotes an Englishman who told him he had seen an eel come nine times alive out of the trail of a raven, absolutely refusing to be digested, thus proving his claim to just as many lives as a cat, for a tenth trial terminated fatally. *Postico fallit clientum.* When pinched by a sturgeon, he has been seen to retreat backwards in the same way, and a German tailor, who swallowed one accidentally, was glad enough to get rid of it on similar terms. He does not appear to have cared to repeat the experiment, though Gesner suggests that small eels might possibly be turned to account by doctors in this way, and save their patients many a nauseous draught." "We are not aware," adds the learned doctor, "that this extraordinary hint has ever been acted upon."

Mr. Stewart, in his "Practical Angler," gives what to me is an evidence of intelligence on the part of the eel which is too striking to be passed over. He says that an eel has been seen to dart suddenly against a trout, striking it so forcibly in the eye by the protruding lower jaw that the trout was stunned and floated insensible down the stream. If it did this knowing, as has been suggested, that it could not eat the fish alive, but could do so when dead, I can only say the eel displayed an amount of forethought which does it much credit, almost as much, indeed, as it does in the following curious allegory, from the before quoted *Dialogus Creaturam Moralisatus*, "Of the Dolphyn and the Ele:" "Ther was a sertayne dolphyn in the see that founde an ele amonge the flodes, and stoppid her passage and pursewed aftyr her. And whan he had takyn her oftyntymes he coude not keep her. She was so slyppere that euyr she escapid. Wherof the dolphyn was greatly soyre. The ele wyllynge to mocke the dolphyn and to escape from him, she spake sotefly to hymn and sayde, thou merreylous dolphyn I sorow hugely for the. For thy laboure is great to swym thus aftyr me, and thy harte is not mery. But thou labourist in vayne, for thou shalt never take me, in the depnesse of the watyr. But goo with me into the middle, and into the drye grounde, and thou shalt have me at thy wyll. This dolphyn was folysh and had loste his wytte for angyr and gulosite, and swam aftyr the ele a grete pace intindinge to destroye her. The ele brought the dolphyn into shalowe watyre and sprange in to y^e^ mydde, and sayde to the dolphyn, Come to me for the rotye of the erbe that lit my passage, and thou mayste satisfye thyn apetite of me. The dolphyn made a grete lepe to catche the ele. But she lurkyd under the mudde, and the dolphyn stak fast in

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the myre. And within a whyle ther cam a fysher and smote throwe the dolphyn and sayde:

> He that hath affectyon with his enymye to goo
> His hurte is to be doubtyd of his mortaff soo."

Apropos of the slipperiness of the eel, Dr. Badham says: "Everyone knows, who may have tried the experiment, that to hold an eel with the naked hand is as abortive an attempt as detaining a pig by the tail after it has been well soaped; or *in morale* to hold a knave to his word. Hence the apothegm *Anguilla est elabitur*, 'he's an eel, and he's off'; but both eel and rogue may be held tight if we set about it in the right way, hence the elliptic proverbial expression to 'hold an eel with a fig leaf' which is alluded to in Alciatus's emblem 'Indeprehensum,' where a policeman thus addresses his captive:—

> "Sir thief, you'r nobbed, and held quite fast,
> These *bracelets* are my seal;
> Your nut's secured,—I find at last
> A *fig-leaf* for my eel."

We are not informed why a fig-leaf is selected for the purpose, but it is presumably because of its comparatively rough structure and texture.

The term "eel" is of Anglo-Saxon origin, the word "fansen" having been anciently used for it. Junius in his "Dictionary Nomenclator Octolinguis," 1619, says "Fausten, prægrandis fansen, eels," which appears to confine the word to larger examples. Hilpert, according to *Notes and Queries*, says "Fansen der menaal"—the sea eel, or conger. Both Ely and Elsinore and Eelpie Island are amongst instances where places have been so called by reason of the former plentifulness of these fish in the respective neighbourhoods.

As to the wholesomeness of the eel opinions have widely differed. Mr. Buckland mentions a case where a large eel was cooked and made all those who partook of it ill afterwards. I know of more than one case also where gastro-intestinal irritation has resulted on their consumption fresh from an unhealthy locality, such as a lake wherein sewage has been suffered to enter. Respectable members of the medical profession from Galen to the present day recommend it. The prescriptions of the earlier members of this community did not, however, intend eels to be generally used as an article of food; that is, indiscriminately in disease and health. Hippocrates expressly says, "This food must be forbidden in tabes and diseased spleen"; and Galen prescribes it as a medicine in nephritic complaints, where the gluten might be thought to concrete gravel into stone.

The monks of Salermo, however, held them in abhorrence; "Doctors of every age have agreed to decry them as most pernicious to health in all

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seasons, but especially during the summer solstice," say they in their dietetic code, and, says Dr. Badham, "in their leonine verses, they go the length of declaring that to live on eels is a sure recipe for spoiling the voice."

Vocilen anguillæ praræ sunt comedantur,
Qui physice non ignorant hoc testificantur.

Pliny also held this opinion, but says, "Singular are they holden to be for to cleanse the humours, either cholericke or phlegmaticke, likewise to cure the infirmities of the spleen; only they be hurtful to the throat, and make a man to lose his voice—this is all the harme they do."

For mine own part, I am like the "lady" of Sir Thomas, in Ingoldsby's before-quoted poem, and own to being particularly fond of the eel, if cooked properly. I would, however, adopt one sentiment from Canne's "Recipes for cooking fish," paraphrased in Barham's verses:

One more piece of advice, and I close my appeals:
That is, if you chance to be partial to eels,
Then—*credo experto*—trust one who has tried,
Have them spitch-cooked or stewed; they're oily when fried.

Of course, if, as I before said, eels are not cleansed after capture from unpleasant localities, injury may ensue to the eater. For example, Juvenal's eel is thus described:

Now comes the dish for thy repast desired:
A snake-like eel, of that unwholesome breed
Which fattens where Cloaca's torrents foam,
And sports in Tiber's flood—his native shore.
Amidst the drains that in Suburra flow
Swims the foul streams which fill the crypt below.

But a Colne, Witham, or Thames eel, kept in a stew and fed on minnows for a few weeks, is one of the finest treats of which I know. One of the old epicureans, we are told, held similar views, in that he averred that any man who could tear himself away from the spot where eels were being cooked must either have brazen nostrils, or no nose at all; and to be rich and yet not have tasted an eel, Philiteus thought should be numbered amongst the misfortunes of life.

Before passing on to a consideration of the eel trade as an industry, I may, perhaps, be allowed to jot down a few prescriptions in which eels take a prominent part. The following is a recipe for "weak nerves":

Take wormwood root,
And gall of trout,
And place them on the fire,
With brain of pike,
Or, if you like,
Take dung out of the bire.

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Then simmer weel,
With oil of eel,
Three spoonfuls to a dose;
You soon will find,
With naught unkind,
Your nerves they will compose.
—W.S., 1702.

Another is against "cramp":

Around the shin,
Tie the skin
Of full from river eel,
And every sprain,
And cramp and pain,
Will fly unto the de'il.

This is much believed in yet in the north, and I have heard of ladies' garters being made wholly or in part of the skin of an eel for the purpose described.

Yet another cure for colic:

For wynd and ventosite, that men callis *Collica passio*, and this es proved; tak and make the a girdle of eels' skyn, and while the weras hit aboute thi body thou sal nought have *Collica pamonem*. (MS. of the 14th century, British Museum.)

With the exception of Scotchmen and Jews, the eel as a food fish is pretty generally liked. Why Scotchmen do not eat them I know not, unless it be because the snake-like form reminds them of the supposed progenitor of the Original Sin, but Jews proscribed them their tables because of an idea that they were scaleless, and hence unclean. The eel was known and worshipped in Egypt, and by the Grecian and Roman epicure made a sort of belly god. Aristophanes, a Greek gourmet, says, "Your idol is my idol too, but in a different way: you Egyptians worship the eel as a deity, I adore him in a dish." "If," says Thaïs to her lover, "If I prefer any stranger to you, my love, may I be turned into an eel, with Callixenus by my side to devour me." The Macedonians were proud of the fish; Sicily boasted of hers; Syracuse could furnish of the best sort, and Bœotia was famed, especially lake Copaïs. What says Lysistria, after breathing out his anathema on Bœotia and its inhabitants? Naught but this exception—"except the eels."

England from very early times has been famed for the fish, and from early times, therefore, one finds chronicles of the productiveness of the eel fishery.

During the mediæval ages this fish was evidently of very high repute; and, indeed, it appears to have been in some cases the almost sole article of diet amongst the poorer classes. Thus Bede tells us, concerning the people of Sussex, "The Bishop (Wilfrid) when he came into this province, and found so great a misery of famine, taught them to get their food by fishing. Their sea and rivers abounded in fish, yet the people had no skill to take them, except only eels. The bishop's men having gathered

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eel nets everywhere, cast them into the sea, and, by the help of God, took three hundred fishes of several sorts, the which, being divided into three parts, they gave a hundred to the poor, a hundred to those of whom they had the nets, and kept a hundred for their own use." Mr. Charles Knight also says, speaking of these times, "The consumption of this species of fish seems, from many incidental circumstances, to have been very great. Rents were paid in eels, boundaries of lands were defined by eel dykes, and the monasteries required a regular supply from their tenants and dependents." The pisciculturel arrangements to be seen at Stanton Harcourt (now in ruins) also strengthen the opinion that the eel was specially cared for. In the "Dialogues of Alfric" there is to be found the following colloquy with a fisherman, showing to a great extent the importance of fish culture in those days:

What gettest thou by thine art?
Big loaves, clothing, and money.
How do you take them?
I ascend my ship and cast my net into the river; I also throw in a hook, a bait, and a rod.
Suppose the fishes are unclean?
I throw the unclean out and take the clean for food.
Where do you sell your fish?
In a city.
Who buys them?
The citizens; I cannot take so many as I can sell.
What fishes do you take?
Eels, haddocks, minnies (minnows?) and eel pouts, skate and lamprey, and whatever swims in the river.

This dialogue refers to three centuries after Wilfrid had taught the people to fish for something more than eels alone, and is an interesting and reliable evidence of what was then being done with the fresh-water fisheries.

Since this time considerable advances in the supply and demand for eels have been made. Mr. Henry Mayhew, writing in 1861, calculates that every year no fewer than 9,797,760 eels are sold at Billingsgate alone; and, of course, this immense number does not by any means represent the aggregate of their sale in even the metropolis. Notwithstanding, the price for live eels is rarely less than 9d. per pound.

Previous to this time, considerably, old Stowe indicates that the Thames almost entirely supplied London with "sweet and fat salmons, . . . barbels, trouts, chevens, perches, roaches, daces, gudgeons, *eels*, &c." "Yet," adds he, "this famous river complaineth commonly of no want, but the more it loseth at one time it gaineth at another." I fancy the consternation of old Stowe were he to awake to-day and find the eels and "sweet and fat salmons" almost entirely supplied from Holland and Ireland and the Scotch fisheries, and the Thames in its lower

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reaches entirely unproductive. As an evidence of the diminution of the fishery by growing impurity and the immense importation from Holland of eels, the following statement, made before a Parliamentary committee, which sat in 1828, is instructive. The clerk of Billingsgate Market said that "the masters of Dutch eel ships a few years before could bring their live eels in wells as far as Galleon's Reach, below Woolwich; but now (1828) they were obliged to stop at Erith, and had sustained serious losses from the deleterious quality of the water, which killed the fish. In the year before eight vessels arrived with full cargoes of healthy eels, about 14,000lb. each, and the average loss was 4000lb. One witness deposed that he had had 3000lb. of eels die in an hour."

The trade with the Dutch in 1842 varied between sixty and eighty boats annually; they brought about 1700lb. each. Of course, it is greatly increased at the present time by reason of vast accessions from Ireland, and altogether comprise a very important item in public commerce.

According to Couch, writing much more recently, the value of the trade is estimable at £20,000 annually, and in Billingsgate alone 10,000,000 of these fish are sold each year.

The capture of the eel has been to me a source, more than once, of amusement and gratification. When the equinoctials blow and the land floods rise, this fish holds high carnival. In the night watches, when other fish are very properly sleeping, or at least quiet, the eel is wide awake, and the unsuspecting freedom of its gambols renders it an easy prey to the wiles of human wisdom. During such time the chief delight of this curious fish is to glide peacefully and rapidly onward ahead of a sharp flooded stream, unmindful of where it runs and when it will stop. Consequently, in the lesser tributaries of the Thames and other rivers eels are not unfrequently taken in large quantities by properly constructed nets placed for their reception. Nor is this the only method practised. For those of ripe age and experience, who perchance stay prudently in the mill head and refrain from the seductive pleasure of passing the sluice, or who remain in the lake and exhibit no desire to explore the depths of the rushing water at the penstock, the skilful fisherman sets his baskets or eel pots and lines.

A night's eel fishing—for it can only be done at night with effect—is therefore no inconsiderable means of enjoyment to one who possesses sufficient love of sport to overcome the depressing influence of heavy rains and a tempestuous sou'-wester. These same influences once conquered, the excitement of a really good night's eel fishing is worthy of compare, if only because of its novelty, with the satisfaction derived from howsoever good a day's angling.

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A successful night's eel fishing, however, depends upon the following conditions: First and foremost it must *rain* in all senses of that uncomfortable word; secondly, reliable waterproof clothing is indubitably necessary; thirdly, an expert old hand—a fisherman as commander-in-chief—properly supplied with a "wee dram drappie" at intervals. Given all these requisites the following is the *modus operandi* of a night's eel fishing:

Towards dusk the fisherman, laden with the most intricate and labyrinthine of nets called a "flue" net, trudges his way towards a certain preserved pond or lake which report says is filled with eels, which no one can catch in quantity. But your fisherman reasons thus, *à priori*—"if the eels cannot be caught by rod and line, it clearly is because they have an objection to the means used; if, on the contrary, the means used jumps with their predilections, all difficulty vanishes." He, therefore, at the mouth of the penstock through which the overflow of water escapes, affixes his net, which is about 16yds. in length, and tapers off to a sharp extremity.

The inside of this net contains several funnel-shaped bags, the wide part open towards the mouth, and the lesser ends pointing towards the close meshes of the extremity. The reason for this formation is obvious. It is easy enough for the fish to effect an entrance, but unconscionably difficult for them to re-ascend through the small holes of these funnels which open inwards and towards them. Therefore, the only attention required by the net is an occasional clearing from weeds, dead water rats, *débris*, &c., and eels. Three or four times during the term of darkness is sufficient for this process, if the rubbish be not excessively plentiful and the eels not very numerous. A string for the better handling of the extremity of the net should be attached to it, and this pegged to the ground in a position which in the darkness will not be overlooked.

In order to render the picture of our supposititious night's eel fishing complete, it is necessary for the reader to imagine himself within reach of a sharp flood-swollen brook, which is, perchance, too wide for netting in the way indicated above, but in which at various stages eel pots and baskets may be judiciously placed. These eel pots are usually made on the same principle as the aforesaid net, that is, they contain the trapping arrangement in the shape of a funnel, which, once entered, allows of no escape. Owing to the instinct of seeking the lower parts of streams which prompts eels to travel a flood, there is nothing, during such a night as I am referring to, to do to the baskets or pots but place them in a convenient position so as to embrace, by their congregated mouths, the entire width of the water. This may be impracticable, of course, but we will, in the present instance, suppose that it is not.

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Thus, in some cases within my own experience, I have been rewarded, by the time the weird heron has announced overhead the opening of the "eyelids of the morning," with almost a sackful of eels. There is no monotony in the deluging rain and the darkness, there is no tediousness about the intervals of sport, and, if one be plentifully provided with waterproofs and creature comforts, the novelty is rather pleasing than otherwise.

Eel angling, properly speaking, does not exist, for it is almost impossible to fish successfully with rod and line for these slippery customers. Of course, occasionally, when angling for barbel in the Thames, especially towards eventime, one gets an eel, or rather grig; but the fish is a terrible nuisance, and has a remarkably developed and most unhappy faculty of twisting the attached line up into inextricable Gordian knots, and of provoking the unbounded exercise of the vituperative powers of its captor. Altogether, he who would desire to fish with a line for the ordinary eel must pursue a different method and adopt different tactics. Incomparably stouter tackle, and much more peremptory usage than is allowed by the sternest angler, are required to allow of an ordinary amount of pleasure or capture.

There are three methods of line fishing for eels: two that may be practised by day, and one applicable for night work only. The former two are colloquially termed "sniggling" and "bobbing." Sniggling is thus performed: A darning or ordinary baiting needle is threaded with worsted of a very woolly nature, the softer it is the better; a length of some four or five feet is required. The needle is run through a lob-worm lengthwise, and the worm is then loosely tied in a knot. Fifty or sixty more worms are served in the same manner, until the knot has assumed the character and size of a ball large enough to just fit a quart pot. It is then securely attached to a stout cord, and is ready for action.

A still, warm, sultry night is the best for this style. Indeed, eels are, unquestionably, even more on the alert for food when an atmosphere charged with eruptive electricity prevails. I have, over and over again, proved that such electrical disturbance, instead of sending them off the feed, rather awakens and encourages their appetites, in as considerable a way as a clear moonlight night detains them from coming out for food. In this conclusion I am borne out by that epitome of all knowledge—Shakespeare, in the passage from *Pericles*, Act iv., Scene 3, referred to on page 342. I think if I tried I could prove the immortal bard an angler; anyhow he knew enough of fishing to be so.

But to return to the *modus operandi* of "sniggling." Having repaired to a still, deep corner in a boat,—which is indispensable, usually, but

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should be quietly handled,—throw out the ball of wriggling worms without unnecessary noise, and not far from the boat, holding the line between the finger and thumb of the right hand, and having it wound round the left for security. In this position calmly wait, being, however, prepared to rapidly draw the bunch of bait in. Presently, perchance, there comes a tugging and tremulous sensation from the bait; let this continue for a few seconds,—till you have counted ten, say,—then quickly, but without jerking, draw up and lift all into the boat. You will probably find a voracious eel still attached thereto, having embedded its sharp bristling teeth, backed by jaws second in power to the pike only, into the yielding mass. The worsted, of course, entangles its teeth, and it is thus secured. If it be desired to dispatch the captive, it is only necessary to place the foot upon it, and insert a penknife just through the vertebræ at the base of the brain. Instant insensibility results, and almost entire paralysis of the body. The head still retains its power of biting, however, so I advise the tyro not to play with the jaws.

The other method, "bobbing," is entirely different. During daytime, eels, like foxes, usually lie "close." They are to be found in the mud and under stones and woodwork, quietly lying *perdue*, or waiting the approach of something to eat. In order to gratify their longing, the piscator arms himself with the two topmost joints of his jack or barbel rod, and binds, somewhat tightly, upon the end a piece of stout brass wire, about six inches long, slightly curved, the use of which will be apparent presently. In his side pocket he carries his jack reel, and from it he unwinds about two yards of the line and passes it up the rings of his improvised rod, omitting to do so through the top ring, as that is invested by the wire. At the end of this line a stout sewing needle is tied, either by means of two clove hitches and whipping the extreme end to the needle, or by merely whipping with waxed silk. The line in any case must be attached to the middle of the needle, so that the latter when suspended by the line hangs at right angles to it. The needle forms the retaining weapon when the fish has swallowed the bait,—I had almost said "hook,"—and is thus baited: A lob worm is first rolled in sand, and then taken between the forefinger and thumb of the right hand, the needle, with the line pressed parallel to it, being retained, point first, with the forefinger and thumb of the left. The needle is then passed into the worm throughout its body, and the bait, presenting the appearance of a worm hanging head downwards from the line, is complete. It is now also passed on to the wire at the end of the aforesaid two joints of the barbel or pike rod, in such a way that the wire extends almost to the head. The apparatus is now finished.

The method of manipulation is as follows: The line is held loosely in the left hand, whilst the right is engaged in using the wired top of the

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rod as a sort of probe into all sorts of odd out-of-the-way places, such as roots of trees, beneath large stones, boulders, &c., by the sides of stumps, and especially in the indentations to be seen in summer through clear water in the mud of either pond or stream. Therein often lie eels of size, and the tyro should be very careful to learn how to detect these, so that no chance be left untried to increase his bag. Immediately the worm is pushed against the olfactory nerves of a recumbent eel—as he is ever unable to withstand taking it—he instantly opens his jaws and closes his vicious little dagger-like teeth over it, biting, even to the wire, with relentless strength and pertinacity. The wire may then be withdrawn, and the fish will remain in possession of the bait and the needle, having fiercely shaken, with wonted ferocity, the top of your improvised rod. Let five minutes now elapse for the pouching of the worm. Then smartly tug at the line, and by so doing you fix the needle crosswise in the animal's throat. Struggle as your captive may, he cannot get away from the snare; for a needle so fixed is really and truly harder to extract or to break from than a hook. Out, therefore, his eelship is drawn, and your capture by "bobbing" is accomplished.

The other method is by means of night lines; but let me first say that wherever other fish are preserved night lines should not be used. Trout, for example, feed largely at night, and many a good fish has met its death in the river Thames, as well as in other rivers, because of the deadly line lying so unobtrusively on the bottom throughout the quiet night. Night lines should be of good cable laid cord, which has been previously soaked in hot water to remove the size, and stretched almost to breaking point to dry. The hooks are ordinary Redditch hooks, flattened in the shank, and tied. These are either baited with minnows, or other small fish, by passing the point in at the mouth and out at the tail; or, in the case of larger fish-bait, by means of a baiting-needle, which leaves the hook out of the side of the mouth. Worms, pieces of fish offal, young birds, mice, or frogs, are all of use; especially frogs in the early summer, which, I am informed, they never refuse. These baited hooks, whilst the main line is still stretched out, are attached to it, so as to be readily undone in the morning. The whole of the baits are then gathered up by the right into the left hand, and neatly tied close up together, just below the hook-shanks. By doing as here directed, a number of long lines may be baited far from the water, and carried there without fear of entanglement. The baits when in the water should not be able to get within a yard of each other, so that no two eels could co-operate in mutual endeavours to free themselves, —a result which will inevitably ensue if they should manage to entwine their tails.

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This kind of line is only really capable of successful "laying" from a boat. A short one on the same principle may certainly be thrown out from the bank, but the chances of entanglement are so many, and of breakage so great, that I condemn its practice in favour of the "trimmer" to be yet described. When the former line has been conveyed on board, it is necessary to undo the baits and carefully spread them a few inches apart, just over the side of the punt, in such a manner that when one extremity of the line is dropped overboard, attached to a weight, the progress of the boat will enable all the others to slowly assume their position until the other end,—also connected to a weight, to which a cork-marking buoy or float should be attached as well,—be reached. This should be quietly dropped over, being careful that the prime line is not stretched, for undue tension will cause the best cable laid line to twist, and thereby furl up the hook lengths of twine. Night lines of this character should be laid across the stream, and just outside the margins of deeps in the summer time, and always in deeper water as the year wanes. The chief season for such fishing is early, mid, and late summer, and it is very effective.

As indicated above, when a boat is not to be had for such a purpose, and it is desired to try the night line for an eel in some pond, may be, gravel-pit, &c., the ordinary bifurcated trimmer may be used. This consists, as is known to almost everybody, of a two-pronged fork cut from the hedge, Y shaped. To the lower part of the Y is attached the twine, of a length of about four yards, and while one end about a foot long is left loose, the other is twined in and out and round the two arms, in a figure of 8 form, finally to rest in a slit made in one of them. The shape shown must now be imagined as turned upside down, for it is thus that it is hung upon a branch or stick overhanging the water. The bait is the same as before particularised, and sufficient line is drawn from this improvised reel to allow of its being pitched out some little distance. When a fish takes it, it, without let or hindrance, draws out the line, the suspended trimmer allowing of this without a chance of entanglement. It is very deadly, and a great number of such instruments can be laid without exciting attention, as its "wooden" aspect does not conspicuously show, except to the initiated.

I have had occasion to put down a great number, and in connection therewith I remember two very curious incidents, which may be interesting as serving to relieve the dull monotony of the foregoing technicalities. One morning on taking up some I had laid with hooks armed with wire and baited with small fish (dead), I was surprised to find one of them "run out," and that not water-wards, but land-wards. This was, at least, very surprising, and I was not long in ascertaining the

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cause. At the extremity of the line I saw a large barn-rat, so securely hooked that it could not move its head with any chance of gnawing the line asunder, if it so desired. Rather higher up the line, I beheld a moor-hen threaded quite through its throat, and above that the bait. These were so curiously in connection that I was quite a long time in theoretically solving the puzzle. At last I arrived at this conclusion: The moorhen had taken the eel bait (as I have known moorhens repeatedly to do), and whilst thus hooked the rat had assailed it, and on biting voraciously through the throat of the bird had become impaled. It is a known fact that the barn-rat is quite capable of such a deed of villainy. The other little episode is equally singular. On visiting a line set under a drooping oak tree, whose branches almost touched the water, I was surprised to find an eel, of nearly a pound in weight, high up in its branches. How it got there, goodness only knows. There were three available suppositions. One, that some one threw it there; the next, that a heron had lodged it there; and, finally, that it had climbed the tree or branches itself. The two former were unlikely, for many reasons. The latter, excepting its unlikelihood in the idea of eels climbing, really seemed the most ready solution of the difficulty, for on the grass beneath the tree and on the branches referred to, as well as those leading to the position in which it was found, could be seen the unmistakeable slime; and the Gordian knots in which it had enveloped itself and its support were indicatory, surely, of such an acrobatic feat. Anyhow, there the fish was, with the line knotted inextricably, and itself choked. The only direct branch from the water's surface was entwined with the line, and I can only suppose that this gymnastic member of the slippery family sprang from the water over the bough, and, finding itself suspended, by means of its ever ready tail and remarkable perseverance, it performed the feat which I have related.

There are some persons who think that eel fishing by any means is allowable. Probably it is, because being a fish given to deeds during the darkness, and shunning as it does the frankness of daylight, it, like the owl and cat, may be said to be a night prowler and mysterious, and not amenable to ordinary rules of sport. For such sportsmen there yet remains the eel-spear to be referred to. This instrument, many pronged and barbed, will, with the rest of the engines of destruction, be pourtrayed in the section treating of tackle, and therefore I will only refer to its most favourable use here. This depends greatly on weather, but it may be said that usually on clear, but sultry days, a good basket may be obtained by suddenly plunging the prongs into the mud wherein the fish is suspected. Of course the exact spot is to some extent dependent for its determination on the result of the prod, but as in the case of

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"bobbing" the experienced and watchful angler will spot more fish than the tyro. *Moral.*—Learn by observation to detect the almost imperceptible indentations which form the breathing holes of eels.

And here, in conclusion, a word may fitly be said in reference to the bubbles which often arise from mud, stones, and deep water. Even old anglers will aver with confidence that they proceed from fish. In some instances this may be so, but in the very great majority it is not. They commonly are bubbles of sulphuretted hydrogen gas generated beneath the surface of the ground by some sort of chemical action—probably the decomposition of organic matter—and held till no longer of a quantity admitting it, by capillary attraction to its surroundings, be they stones, sticks, or any of the indescribable flotsam and jetsam forming the bottoms of lakes and rivers. Indeed the quantity of this gas which is generated in some localities, where much vegetation enters or exists in the water, is very notable. Let anyone bore a hole in the bottom of a zinc pail, insert therein a gas burner or tobacco pipe, and having filled it *inverted* with water, stir up the mud beneath with a pole till it is filled with gas, then testify to the truth of my statement. By pressure on the top of this extemporised gasometer, a jet of gas may be burned at pipe or burner's end of a brilliancy certainly nearly that of the inferior rubbish which is supplied by gas companies, and supposed to be properly carburetted hydrogen.

Sometimes, of course, an eel and sometimes even a pike will, however, expire in atmospheric air laden with carbonic acid gas, but that is under actual pressure, in the form of pain or great physical discomfort. In nine cases out of ten the bubbles arising from the water or submerged earth are due to the natural formation and liberation of gas.

Speaking of the capture, &c., of eels, Dame Berners thus says: "The ele is a quasy fysshe, a ravenour and a devourer of the brode of fysshe. And, for the pyke also is a devourer of fysshe, I put them bothe behynde all others to angle. For this ele ye shall fynde an hole in the grounde of the water, and it is blewe-blackysshe there, put in your hoke tyll that it be a fote wythin ye hole, and your bayte shall be a grete angyll twytch, a worme, or a menow."

The sharp-nosed eel (*Anguilla acutirostris*) is the most abundant and most delicate of the eels, and is chiefly taken in the Irish fisheries. All our rivers may be said to produce it, and it is known on all the shores of the Mediterranean, so far east as Greece. Dr. Badham gives a most amusing account of the eel market of Naples, where the fish is an article of commerce of especial prominence.

In *Anguilla Acutirostris*, the head is compressed, the top convex, depressed as it slopes forward; the eye small, placed immediately over

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the angles of the mouth, irides reddish colour; the jaws very narrow, slightly rounded at the end, the lower jaw the longer; nostrils with two openings on each side, one tubular, the other a simple orifice; both jaws furnished with a narrow band of small teeth, gape small, various mucous pores about the mouth and other parts of the head; gill-opening a small aperture immediately before, and rather below the origin of the pectoral fin; the scales on the body rather small; dorsal fin extending over more than two-thirds of the whole length of the fish, anal fin occupying more than half of the whole length, both united at the end, forming a tail; the number of rays in the fins not easily ascertained from the thickness of the skin; the lateral line exhibits a long series of mucous orifices; vertebræ 113; the vent includes four distinct openings, the most anterior of which leads upwards to the intestines, the posterior to the urinary bladder in a direction backwards, and one elongated lateral opening on each side communicating with the cavity of the abdomen, as in other bony fishes.

Anguilla Hibernica, or the Dublin eel, is described as a distinct species from the others, and although it bears a close resemblance to the foregoing, I am induced on examination to believe that our foremost ichthyologists are right in classing it in a distinctive way. It seems to approximate to a species termed by Cuvier *Anguilla longbec*. Thompson says that he observed an eel from Stranford, which he believed to be different from the recognised British eels. It is to be especially noticed that the Dublin fish (a specimen of which I had from the Liffey, from which water the one described by Couch was also obtained), is shorter in the muzzle or snout, and the lateral line is more plainly marked than in the *A. acutirostris*.

The specimen I obtained measured two feet, its body was, if anything, not so attenuated as the *A. acutirostris*, but broader and more rounded; the head was wide, flat, and sloping forward to a snout, which was very narrow; the under jaw long and wide, but not nearly so muscular or so large in bone as the *A. acutirostris*—and, of course, not nearly so as the *A. latrirostris*. The pectoral fins were larger, and the jaws more thickly studded with sharp teeth than the other species. Colour, brownish green, and whitish below; tail very dark at its border.

The broad-nosed eel (*A. latrirostris*) seems identical with the "slug" eel of Thames fishermen, and is of a widely different appearance, being thicker, coarser skinned, and broader-headed than either of the others. Its appetite is also more voracious, and of a much less particular kind. It will devour dead flesh and such garbage, even after it has become tainted. The following are its points:

The broad-nosed eel has the head rounded at the back part, and

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flattened from the eyes forward; both jaws broad and blunt, the lower jaw the wider and longer than the upper; nostrils double, one tubular, the other a plain orifice; the gape large, lips fleshy, teeth more numerous than in either of the other British fresh-water species, larger, stronger, and forming a much broader band in each jaw; the eyes large, placed before the line of the gape; irides golden yellow, the gill-openings, pectoral fins, the commencement of the dorsal fin, and the vent placed farther back than in the sharp-nosed eel; dorsal and anal fins also much deeper and thicker, the tail broad and rounded; the body of the fish thicker for the same length than in other eels, the number of vertebræ 115.

The snig eel, so called and classed by Yarrell as *A. mediorostris* is, in my opinion, the young *A. acutirostris*, and is not a separate species. Couch agrees that the differences cannot be readily appreciated. Stress has been laid upon a supposed deficiency of bony processes springing from the vertebræ in this eel, which are present in other species. I think, however, that this is an error. A question has arisen whether this fish is that which, at the end of Ray's "Synopsis Piscium," is termed a "free eel" (*A. libera*), and of which he says: "A congero differt saporæ fucundiore et ossicolosum defectu quibus Congri abundunt," and a question also arises in my mind, whether it is not the same as the "Grigg" of the Thames fishermen. Both are of small size, and both very closely resemble each other—at least I do not see any material difference. If this be so, I have only to add my further conviction that both are only different to the before-mentioned species because they are young and immature, not having spawned.

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CHAPTER XXXIX.

THE LAMPREY.

THERE are only three species of the Lamprey family likely to be met with by the ordinary student of British fresh-water fish or the angler-naturalist; and these are the sea lamprey, or *Petromyzon marinus;* the lampern, or river lamprey, *Petromyzon fluviatilis;* and Planer's lamprey, or *Petromyzon Planeri.* There is another species, called the sand pride, or *P. branchialis,* to which I shall also advert, but it is of little interest to the practical fisherman. I shall take these, and briefly consider them *seriatim.*

P. marinus. The generic characteristics of the Petromyzon family is as follows: Body smooth, elongated, cylindrical, like the eel; rounded head, mouth circular, armed with hard toothlike processes, the lip forming a continuous circle round the mouth; seven apertures on each side of the neck leading to branchial cells; pectoral and ventral fins absent, the skin towards the tail extending to form (both above and below the dorsal), anal, and caudal fins. These fishes are of a very low order of organisation amongst vertebrated animals.

Having no bladder and no pectoral fins, they are all usually found near the bottom, and, in order to support them in a fixed position in running waters, the peculiar shaped mouth, already described, is brought into requisition in a somewhat similar way to the ordinary leather sucker used by boys to fling stones. The fishes attach themselves, indeed, as the name implies, to stones, and thus are enabled by the extraordinary power of suction they possess to preserve their equilibrium in the flowing water. Nor is this peculiar property simply used for the preservation of the fish's position. Sir William Jardine says: "They ascend the rivers to breed about the end of June, and remain until the beginning of August. They are not furnished with any elongation of the jaw afforded to most of our fresh-water fishes to form receiving furrows at this

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important season; but the want is supplied by the sucker-like mouth, by which they individually remove each stone. Their power is immense; stones of a very large size are transported, and a large furrow is soon formed." The lamprey under consideration remains in pairs on each spawning place, and retain themselves as described.

When the lamprey is attached to a stone, it is obvious that it cannot take in water at its mouth, and expel it at the opening of the gills, or branchia, as do the rest of fresh water fishes. Professor Owen has asserted that in such cases the water is drawn in and expelled through the opening of the gills. This I have verified, and mention because the student might otherwise, on watching the attached fish, wonder how the animal sustains life. There are no convolutions in the intestinal canal, which is small, and extends in a straight line to the anal aperture. They are oviparous, and, according to Mr. Yarrell, spawn late in the spring, a statement that will be seen to be at variance with the extract given from Sir W. Jardine's work, though I am inclined to believe Yarrell is right. The roe, it appears, is expelled in both sexes by a small membraneous sheath, which has internally, at its base, five apertures,—one leading to the intestines, one to each kidney, and one to each lateral cavity of the abdomen.

The geographical distribution of this fish is of a very extended character. It is found in the Mediterranean, as far north as Scandinavia, and even Iceland possesses it, while it is common to North America.

The sea lamprey (*P. marinus*) is common in spring and summer in rivers of the south of England, particularly the Severn. It is also found, but in sparse quantities, in Scotland and Ireland.

It is seldom more than from a foot and a half to twenty inches in length in waters of the more northern latitudes, but grows to a very large weight and bulk in the more southern localities.

Yarrell obtained specimens from the Severn, and I have seen them measuring twenty-eight inches in length, by Worcester, Tewkesbury, and Upton-on-Severn. In the "faithful city" they are sold potted, and though there are those who deem them delicious, I must certainly say I cannot coincide. Perhaps, as I do not care for truffles and high game, it may be said that my taste is not of a very highly cultured nature.

These fish are but rarely found in the Thames. It is on record that two have been taken as high up as Sunbury, but these captures, though indubitably substantiated, were made some forty-five years ago. The Scotch fishermen commonly return them to the water when they find specimens in their nets. This is, however, not surprising, for they dislike eels. It is stated by Pennant that the Gloucester folk send a pie of

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lampreys to the reigning Sovereign every year. This may have been the case many years ago, but I could not verify it from inquiries made by myself some few years since in the city.

The food of *P. marinus* is chiefly soft animal substances. It is said to have been known occasionally to kill fish by fastening on to them with its powerful sucker, and grinding its way into the flesh till stopped by the bone. This is most unlikely to occur, however, except in the cases of very lethargic fish.

The skin of this lamprey is smooth, and its colour of olive brown, mottled and spotted with darker green and brown; its fins occasionally present an inclination to reddishness, and are *usually* of a lighter brown than the surrounding parts. The irides are golden yellow.

This fish swims in a very peculiar and quaint manner when it meets with very rapid streams. It *gets* along—for no other expression can do justice to its style of movement—with a series of jerks, but when in slow or stagnant water no especial peculiarity is observable. The progression, however, is very much less graceful than that of the eel.

The lampern, or *P. fluviatilis*. This fish is much better known in the Thames, the Severn, the Dee, and the Tweed than either of its *confrères*. Whilst the others are only to be found running in fresh water at a particular season, Yarrell states it as his certain belief that these fish may be taken from the Thames at any time during the year. I cannot agree with him, because, except in the autumn or early winter, I have never taken the fish. That so careful and reliable an observer did not speak without some good reason, goes without saying, however, and I can but leave the matter with the simple expression of the negative evidence above given. In any case the lampern is in best condition from about October to March. Formerly the lampern fishery of the Thames was of very considerable importance. From Battersea to Taplow, they might be taken at the time of which I speak—fifty years ago—though it is doubtful if they are to be found now higher up than Chertsey or Penton Hook. Teddington is the present chief place of capture, and really immense quantities are now taken there in eel pots, and sold chiefly, I am told, to Messrs. Crosse and Blackwell, for preserving. Formerly they were regularly brought up by the Dutch as bait for turbot and cod. Yarrell states that in one season alone as many as 400,000, at 40s. per thousand, have thus been disposed of, and on occasions, when from growing scarcity or other causes, they have risen in value, as much as from £5 to £8 per thousand has been paid for them. At the height of the prosperity of the fishery, as many as 1,200,000 fish have been taken in one season. The tenacity of life possessed by the lampern rendered it a valuable bait, if no other quality recommended it. The Dutch fishermen were able to keep

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it alive for days in the sea water; indeed, its vitality under privation seems only second to the eel.

In spring time especially it is quite easy to determine the sex by appearance. The male has much larger lips, and the female has a much more protuberant stomach. The aggregations of fat and ova produce the latter difference, as might be imagined. The average size of both does not exceed fifteen inches. The colour is a pale blue on the back, shading off into silvery white underneath.

The lampern was probably known in very early times in England. Hence, Dame Berners, after recommending a bait for trout, says: "In Apryll, take the same baytes, and also *Juneba*, otherwyse named VII. eyes." Whence the word Juneba I leave my philological readers to determine.

There is also in that curious old book to which I have before adverted (*Dialogus Creaturam Moralisatus*, written by no-body-knows-whom, and when, I cannot say), a quaint fable referring to "A Lampurn and a watyr-beaste callyd Crocodilus," which thus runs:—

"Murenula as sayth Brito is a fissh lyk to an ele. In Englyssh callyd a Lampurn. Uppon a tyme this Lampurn fownde the children of a water-beaste that is callyd Crokodylus, which is lyke unto a lacerte. And whā she had beholde them, she kylled them, and went forth her waye. This beaste Crocodilus whan he was come agayne and sawe his children dide, he was bitterly grevid, and made sorowe more than can be tolde of, and disposyd hym withe all his myghte and power to avenge the dith of his children. Wherfore he went dayly in haberiony and harneys and laye in a wayte for to fle the Lampurn. And uppon a tyme he fownde a cruell serpent and a venymous, and belevyd that he hadde a Lampurn, and went agayne hym and sayde: Thowe cursyd wretche, nowe shalt not thowe escape. For thowe slewyste my children cruelly withowte cause. Therefore now I shall flee the and destroye the. To whom this serpent answerde and sayde: Be thou ware and wile advysed by my counsell, for I am no Lampurne, but a poysonde serpent, and yf thou presume to come to me I shall soone infecte the with my venyme. Then sayde the Crokodyll: Thow canste not disceyve me, nor hyde the from me, for thou arte no serpent, but thou art a Lampurn, and thou art made as she is in every pointe. And therfore I shall flee the. And whyle this crocodyll in greate haste, and with greate modenesse ran to he hym, the serpent fortified himself and bote him and poysonde hym, and sayde:

With him yt is unknowyn to chyde or to fight,
No man owith that intendith to doo right."

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I think as this translation dates from the fourteenth century, the reader will think it worthy of preservation.

The fringe-lipped lamprey, or *P. Planeri*, is found in the rivers Forth, Allan, and Teith, in Melrose, and, according to Yarrell, in Surrey and Sussex; also, according to Couch, in Cornwall, Lancashire, and the east of the Tweed. I cannot say I have been able to identify it personally. I give, however, its generic characteristics which distinguish it from the foregoing lampern—the orifice of the forehead, the eye, and the front branchial apertures are much nearer the anterior edge of the lip than in the other species; the colour is, however, the same, or only slightly differing, according to locality. Its habits also do not vary, so far as are at present known.

Bloch named it after his friend Planer, who sent him specimens, and Yarrell is satisfied as to the difference of species. I therefore have thought fit to refer to it, though I hardly fancy the average angler will meet with it. Its food, like the former members of the family, consists of small soft insects and soft animal remains, as well as worms.

The sand pride (*P. branchialis*) belongs to the sub-order *ammocœtes*, of which the following are the generic characteristics:

Form of body and branchial apertures and fins like those of the lamprey; upper lip, semi-circular, with a straight transverse under-lip; mouth without teeth, but furnished with numerous membranous cirri.

The principal difference is certainly in the horse-shoe shaped mouth, and the fact that it never attaches itself by suction. It is somewhat plentiful around Oxford, and rarely exceeds the length of six inches and the thickness of a swan quill. A local historian, from its being found in some numbers in the Isis, termed it the "Pride of the Isis," but the word *pride* in this connection cannot surely mean anything noble of the fish over which the river god might be proud; rather I imagine it to be a stupid edition of *prid*, which word is a diminutive of Lam-*prey*.

Yarrell states the fish is sometimes found near Hampton, and that eels are very fond of it. This latter truth I can testify to, for when they have cared but little for worms I have repeatedly caught them with these worm-like "sand prides" (which, by the bye, are occasionally found near Uxbridge, in the Colne).

The food of this fish is chiefly insects of a very minute size, and trout eggs when procurable, and probably other fish spawn, worms, and grubs. It spawns in April or May.

From experiments I have made I am convinced that the fish is chiefly nocturnal in its habits. Certainly it sleeps very much in the daytime, or,

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at any rate, is somnolent. Its eye is exceedingly small, and its colours are various shades of yellow and brown.

The methods of capture for lampreys are only by bucks or baskets, similar to those for eels. These may be set in warm wet weather at the tails of such waterfalls as may be in the neighbourhood. This, at least, as before indicated, is the only method employed at Teddington, where my experience of this family has been chiefly gained.

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TACKLE AND TACKLE MAKING.

CHAPTER I.

INTRODUCTORY.

IN the following chapters it is my intention to supply the angler with brief descriptions and illustrations of such tackle as he may require in his travels after sport. As indicated in the former part of this work, a separate section is necessarily devoted to this object. In addition to this, I purpose explaining, as far as is ordinarily useful, the methods of tackle making. Except in connection with the raw material I always, or nearly so, manufacture my own tackle. Of course, I do not make my own hooks, but I do whip them on to their attachments as occasion requires; and so, I think, ought every angler, if he wishes to acquire an accurate knowledge of his resources. By the word resources I mean the strength of his tackle; for no man can tell whether a ship will weather the blast unless he has some idea of how it is put together.

I purpose, therefore, giving such particulars of tackle and tackle making as will enable the veriest novice to acquaint himself with the art of preparing his own lures. The time will never come again when every angler will make his own rods or hooks, but there is no doubt the time will be, and possibly now is, when each clever fisherman will adapt his baits to the inbred predilections of the finny tribe, and when he will become, to a certain extent, independent of all but the rod, hook, gut, and gimp-maker, so far as tackle *making* is concerned. There is considerable difficulty in explaining mechanical processes to the enlightenment of the reader and the satisfaction of the author, and especially those which depend for their effective execution upon dexterity. The

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ability to "snatch a grace beyond the rules of art" is not given to everyone, and the seemingly simple operations of tackle making are often ill-performed, to the disgust of the beginner, because of a lack of dexterity on his part. In the directions I shall give, therefore, clearness and perspicacity will be aimed at rather than rhetorical finish, so that the patient amateur angler may not only pursue the "gentle craft" with success, but construct his own apparatus for the purpose, and thus be in a position of independence of all but the manufacturer of the raw material, and the makers of such apparatus (*par example*, rods), as demand and competition place before him at a cheaper price than he himself could in any case hope to rival.

Tackle making certainly is tiresome, and, like every mechanical art, it is to an extent disappointing until the learner has mastered the rudiments of the business. It then grows interesting, and not only so, but positively a source of pleasure, and a means of saving many a shilling, which is an object with the persistent fisherman, especially, as is chiefly the case, when he is of that important portion of the population known as the "middle class." From this middle class, be it said, the majority of anglers are drawn. The luxuries vended by the high class tackle makers are beyond his means, for he cannot afford to contribute towards the expenses of handsome shops in crowded thoroughfares and country houses by paying fifty, and often eighty, per cent. more than the amount it would cost him to make the article himself if he knew how. Such costly refinements as those referred to, however reliable in point of workmanship and strength they may be, are suitable only to the aristocratic angler, for whom everything must be of the costliest. Albeit such splendid appliances by no means indicate infallibly good sport. I have seen an old bellows mender, with a rod manufactured from superannuated umbrella sticks and a line clumsily put together from the "grey mare's tail," and a cockroach as bait, do remarkably well, when, close by, no sport could be had by the gentleman with his ten guineas' worth of new tackle.

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CHAPTER II.

RODS AND RINGS.

THOUGH, as I have said, anglers are not likely to make their own rods, a few remarks as to their manufacture may not be unacceptable. The rod of Dame Berners was a "staffe," some fourteen feet long, of the "thickness of arme grete," or as thick as a man's arm, and the joints were bound with "hopis of yren," or hoops of iron. The angler of to-day has a rod placed in his hand of exquisite taper, finish, and appearance, far different to that described by this writer of the fifteenth century.

There are as many as ten different woods now in general use for the rod of to-day. Six are solid and four are hollow. The former are as follows:—Hickory, greenheart, ash, willow, lancewood, and red deal; the two last are mostly used in the making of Nottingham rods. Of the hollow kinds, East India cane, bamboo, Carolina white, and jungle canes are the most used.

Greenheart is the most fashionable wood at the present time for solid rods, but hickory used to be. This latter grows in Canada, according to Mr. Pennell, who has been at the pains to get together a lot of information concerning rods, and it is sent over here in "billets," that is, longitudinal sections of a log, each log being sawn from end to end through the middle two or three times, so as to cut up into four or six bars, V shaped, having three sides. On their arrival in England, the billets are cut up into planks, and these are properly seasoned by being packed away for a considerable time before they are used. After this, they are looked over and cut up into joints roughly, and again packed away, to be utilised as required. Of course, the best makers buy the best stuff, and have, in consequence, to make selection with a great degree of circumspection. The inferior wood—*i.e.*, that left by the larger and longer-priced buyers, is sold to smaller makers, and these people are able to produce cheaper rods, although of a necessarily inferior nature.

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Hickory is next to greenheart in point of weight, and is very reliable. It has, however, a greater tendency to warp after getting wet, and is now chiefly employed in the more solid portions of the rod, such as butts or second joints.

Greenheart comes from the West Indies, and is very generally used. Some makers use it alone in the manufacture of salmon and trout rods, but I do not myself favour the wood, it being too flexible for the lower parts of a rod in my opinion. It is very elastic, and may be drawn down to an exceedingly fine size without becoming brittle. A 7ft. joint little thicker than a swan quill at the largest end, is commonly formed of this wood in the make up of a Castle Connell salmon rod. As the joints of a rod made of greenheart are seldom or never straight when fresh from the hands of the sawyer, it is found necessary to render it so by heat and by suspension with weights attached. The straighter the piece of wood is at first, however, the better for the chance of the rod remaining so during its service.

Ash and willow are usually made into second joints or butts; lance is often used in the Nottingham rods for tops; and deal, as it bores readily and is light, serves the purpose of butts in these latter cheap elegant pieces of tackle.

Of the hollow woods or canes, only one is of real utility for a good spinning or fly rod, and that is the bamboo of the East Indies. Its natural length is frequently twenty feet, and the tenacity of its fibre places it far above the other candidates for favour amongst the canes. Of course, the making of a cane rod is by no means so *nice* a piece of work as the manufacture of a rod from various solid woods. Nevertheless, there is in the case of the *split cane* rod a great deal of art necessary for perfect finish and reliability. The Carolina cane is usually used for butts.

The jungle cane, a China growth, but also found in other parts of the Asian continent, is chiefly used for tops, and the making of the split cane rods to which I have just referred. It grows as big as a man's body, and it is only the outer bark or skin which is of any use for the purpose named. This is split up into strips, and accurately fitted and whipped, so that there are often nine sections in a second joint of a rod of this make.

The following remarks are sent me by a tackle maker, and they partially confirm my previous statements: "The best rods are variously made of bamboo, hickory, and East India cane, with ash for the bottom joint. Hickory is used for the second and middle joints of the best rods, with tops of lancewood and bamboo. There are fly rods made of all hickory, others, for spinning, of cane, which is imported from South Carolina and

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from the East Indies. After leaving the saw-mill the wood is turned into joints, the butts of which are then bored to contain spare joints, and then planed ready for the fitting on of the brass ferrules, the best of which are hand-brazed to give them greater strength. Certain of the rods —those for use in Irish waters, especially—are screwed together, not merely placed in the sockets. That beautiful appearance which fishing-rods present is obtained by staining the wood with aquafortis and nut-galls. The stain is burned in immediately after it is put on. The rods are then rubbed with sandpaper and highly polished, a dozen coats of varnish being not at all unusual. The waxed silk which binds the tops of the joints, and the rings through which the line runs, are put on by hand, and the rods undergo another varnishing as far as the rings are concerned."

In the selection of a rod care should always be taken that the ferrules are brazed, that is to say, that they have originally been cut off a sheet of hardened brass and turned into a circular shape and then the edge brazed. If the ferrule has been simply cut off tubular brass—*i.e.*, brass tube, which, being made by machinery, is almost always inferior to the ferrules otherwise prepared—one may be pretty sure that sooner or later when he is making a cast the ferrule will split, and then, of course, his joint is spoiled. This may seem a precaution of minor importance, but I am persuaded that it is as well to be careful in small things ; in fact the angler, if he ever hopes to become a master in the craft, must begin by studying these little matters, which bear about the same proportion to the sum total of angling knowledge as a brick does to the erected edifice. Yet it will be conceded that the brick is eminently necessary to the consummation.

Before dismissing the subject of rods, I must not forget to mention the most suitable form of ring. The first object of rings is to conduct the line, and the next to so distribute the strain when a fish is hooked as to give the rod the best chance of bringing its graduating strength and taper to bear to the greatest continuous effect on the fish, and the least fatigue of the angler. For the first object upright rings are unquestionably the best.

The material for all the rings, excepting the bottom (nearest the butt) and the top, may be of brass, but for these two a different material, as I shall recommend, ought to be used. Before this, however, one word must be added in reference to the other upright rings : they ought to graduate in size according to the rod, from, say, that of a small wedding ring to not less than one-eighth inch in diameter.

I have said that there is a second object which is subsidiary to the primal one of conducting the line, namely, the equalisation of the strain

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when the fish is hooked. Because of this the rings ought to be put on with great care. I have seen the breaking of a ring result in the breaking of the rod at the precise spot where the ring ought to have been—and why? Because when the rod is bent the apex of thebow made between the rings succeeding each way has been at the place from whence the ring has been detached. An undue tension has, therefore, been instituted at that spot, and snap has gone the rod. It is impossible to tell by writing precisely where the rings should be placed, but the correctness of their position may be ascertained by attaching a weight to the line, and watching the symmetry, or rather regularity, of the bend of the rod. If it be bent more in one place than another, the position of the rings requires altering, and wherever the strain appears the greatest there ought to be another ring placed to relieve it.

The top and bottom rings, from their meeting with the greatest friction, ought not to be of brass, but of steel for ordinary inexpensive rods. Mr. Pennell gives a pattern, which I copy (Fig. 1). As the reader will see, it is of wire, and can, therefore, be easily made. Personally, I prefer a ring of steel, which encloses another of well-polished agate, which never wears. This need not be of a clumsy or unsightly nature. Some persons prefer a solid cylindrical steel tip to the top of the rod, through which, a smooth hole being bored, the line passes, and, in consequence, all possibility of entanglement is obviated. This dodge is only applicable for Nottingham fishing, "fine and far off," in which long coils, as in spinning, are unknown.

Fig. 1. Top Ring of Wire.

If the top ring is likely to become entangled with the line, it is a certainty that the bottom ring, under the old *régime* of coiling and throwing, will be so in a tenfold degree—unless some different sort to those used on the joints be adopted. A ring of the following pattern (Fig. 2) will answer the purpose, and if convenient this also should be lined with agate or bloodstone, to avoid friction as much as is possible. Its size, also, ought, for an ordinary trolling rod, to be much larger than the engraving, so as to allow of the coiled line to speed out without much let or hindrance.

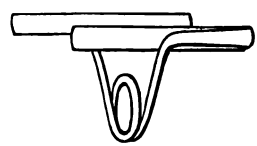

Fig. 2. Bottom Ring.

I have recently had brought to my notice a top ring, which seems to be a peculiar advantage and improvement. It is so constructed that its

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stem works in a ball-socket, or what appears to be so. The result is that it revolves a half turn in whatever direction the angler throws, and thus the friction which is engendered by the impact of the running line on the ordinary rigid ring is in this case avoided. I not unfrequently throw my line over my head, as it were, especially when fishing with the Nottingham running reel, and in such a case, before I used this ring I found the friction referred to very much greater than should be allowed if it could possibly be done away with. The ring in question, no matter the point to which one casts, is turned by the line in a corresponding direction. It deserves, therefore, a place of honour amongst modern tackle improvements.

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CHAPTER III.

HOOKS.

In order to show the difference between the hooks in use when the earliest English book on fishing was written, perhaps I may be allowed to again quote the fair authoress of "Fysshynge with an Angle." This esteemed lady says: "Ye shall understand that the most subtyll and hardyste crafte in makynge of your harnays is for to make your hokis," and I believe her; but, happily, there is no necessity for such a business on the part of the angler of the present day. For the sake, however, of contrasting her directions with a general description of the making of hooks as now practised, I continue to quote what she says: "For whoose makyng ye must have fete fyles, thyn and sharp and small beten. A semy clam of yren, a bender, a payr of tonge, and small tongys, an harde knyfe, som deale thycker and an nedle and a lytyll hamour. And for small fysshe ye shall make your hokes of the smallest quarell nedlys that ye can fynde of stele in this wyse. Ye shall put the quarell in a redde charckcole fire till that it be of the same colour that the fire is. Thenne take hym out and lete him kele, and ye shal fynde him well aloyd for a fyle. Thenne reyse the hende wyth your knyfe, and make the poynt sharp. Then aloyl hym agayn, for elles he woll breke in the bendyng. Thenne bend hym like to the bende fyguryd herafter in example. And greeter hokes ye shall make in the same wyse of gretter nedles; as broderers nedlis, or toylers, or sho-makers nedlis, spere poyntes; of sho-makers naller in especyall the beste for grete fysshe, and that they bende atte the poynt when they ben assayd, for elles they ben not goode. Whan the hoke is bendyd bete the hynder ende abrode, and fyle it smoothe for fretynge of thy line. Then put it in the fyre agayn; and geve it an easy redde hete. Thenne sodaynly quenche it in water, and it will be harde and stronge."

Now the selection of a hook for ordinary fishing in these modern times

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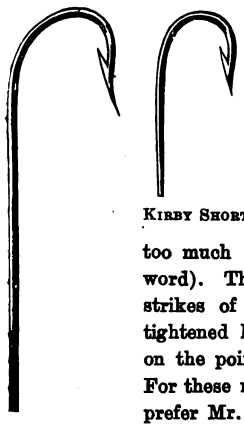
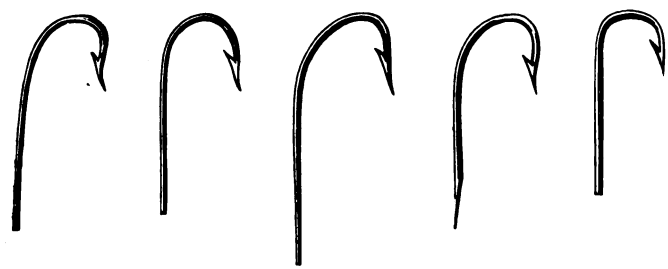
is by no means easy. Opinions differ considerably as to the usefulness of each shape. Roughly speaking, they are of six types—the Round, describing the half of a circle, the Kirby, the Limerick, the Sneck, the Kendal, and the Sproat. Of course, according to the makers, these types vary in unimportant particulars, such as length of shank and barb, set of barb, &c. Now, the evils of most of the ordinary shapes are briefly, over temper in the bend, causing the hook to snap when suddenly struck against the bone of the fish's jaw; want of temper, causing it to straighten under an excessive strain; a wide standing barb, which is especially fatal to certainty on striking a fish; and last, and most important of all, too much "openness" (to use an ugly, but expressive word). This disadvantage has the effect when the angler strikes of losing him the fish, because the suddenly tightened line, instead of bearing directly and suddenly on the point, bears *obliquely*, and thus frustrates itself. For these reasons, of all the shapes now made, I myself prefer Mr. Pennell's improvement, which in effect is as if one took an ordinary hook and with pliers squeezed the



KIRBY SHORT.

KIRBY LONG SHANKED.



LIMERICK. ROUND. SPROAT. KENDAL. KENDAL SNECK.

FIG. 3. VARIOUS SHAPES OF HOOKS.

point and barb closer to the shank by a degree or two. A very good make of hooks, corresponding with the above opinions, is also sold by Mr. Walter Wells, of Nottingham, and Mr. Gregory, Vyse-street, Birmingham.

That the reader may be acquainted with the shapes of hooks, I give an illustration of each sort (Fig. 3) and a plate showing the sizes in each (Fig. 4).

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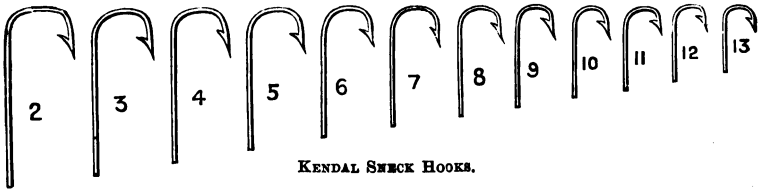
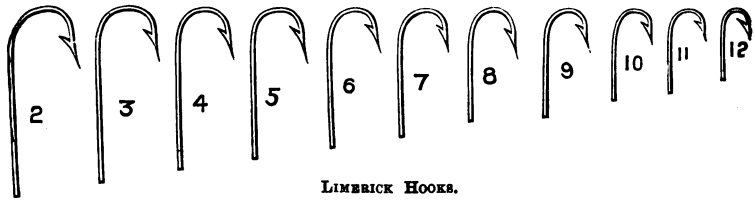
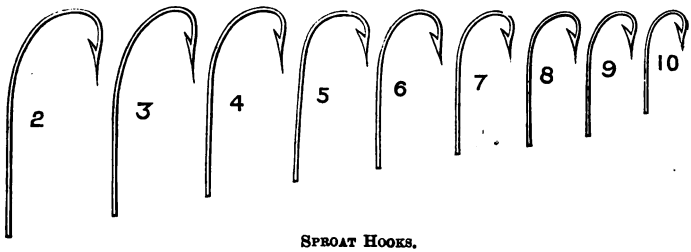


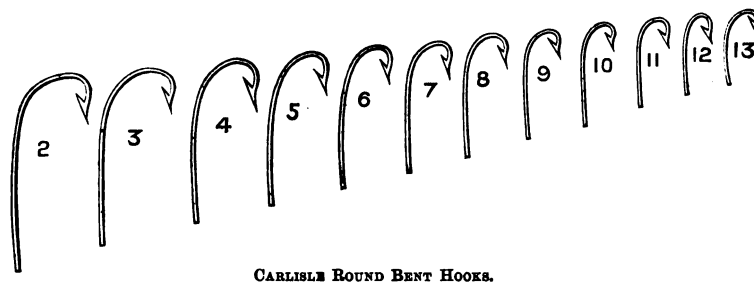
KENDAL SNECK HOOKS.



LIMERICK HOOKS.



SPROAT HOOKS.



CARLISLE ROUND BENT HOOKS.

FIG. 4. SIZES OF HOOKS.

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Mr. Pennell's improvement is as follows (Fig. 5). Now let us consider what is required of a hook, and then it will be apparent why I prefer the make of Messrs. Hutchinson and Sons, Kendal, which goes by Mr. Pennell's name.

Fig. 5. Pennell Hook.

The question first arises, What is the ultimatum aimed at in a perfect hook? This may be answered by the following: Penetration, perfection of holding power, strength, lightness, and finish. First as to penetration. It is obvious that in the ordinary wide open hooks,—and this may be tested by taking a gut-hook and drawing it against a hard object,—semi-circular, or side-twisted hooks, that the coincidence between the angle of impact and the direction of the force applied is very small, and hence, instead of the barb entering the fish in a line with the gut and the top of the rod, it enters obliquely, thus requiring much more force for the accomplishment of hooking the fish; this extra force—as the ordinary hooks are far from being well tempered in the shank and bend—very often either breaks off the barb, or causes the hook to fly at the bend, or, in some cases, to straighten outwards. The consequence, of course, is that the fish is lost. The requisites are, therefore, that the *penetration* of a hook when the angler strikes be perfect, and that the line of the direction of the force applied shall correspond with the point of impact. The following (Fig. 6) shows the superiority of Mr. Pennell's pattern in this direction over that of other makers. It will be seen that the line of impact—that is the line running in the direction of the hook's point—very widely differs in the "Round" hook from the line of force applied, that is the dotted line passing between the shank and the extremity of the point of the hook. In the "Pennell" pattern this difference is greatly reduced—hence its superiority.

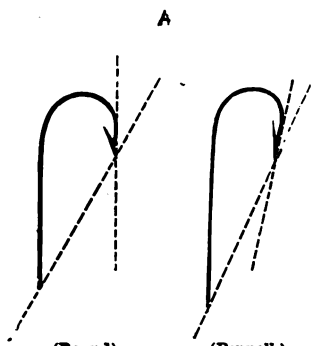

Fig. 6. Advantage of the Pennell Pattern.

Holding power consists chiefly, of course, in the barb being rank enough. The barb must not, however, be very rank, as it interferes with the penetration. This is an appreciated fact in the Pennell, wherein the barb is light and long. There are objections, however, to a long barb, in the fact that it often happens that the part into which the hook enters is bony, and therefore the point, without an extraordinary

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exertion of force in striking, cannot be made to enter far enough to cover the barb. The result is, in practice, that the fish shakes out the hook with the greatest ease. The wide standing barb, like that of the *Round* pattern given opposite, is a much greater nuisance than this; it will simply not enter at all in a great many cases; and I can assure those whose experience may not have led them to anathematise this evil that many a good pike or perch is lost because the hook could not be made to hold without almost pulling the fish's head off. The desideratum for holding power, to be consistent with perfect penetration, therefore, must be a short barb, which offers little or no resistance to the strike and the entering of the hook, and yet does not let the fish escape.

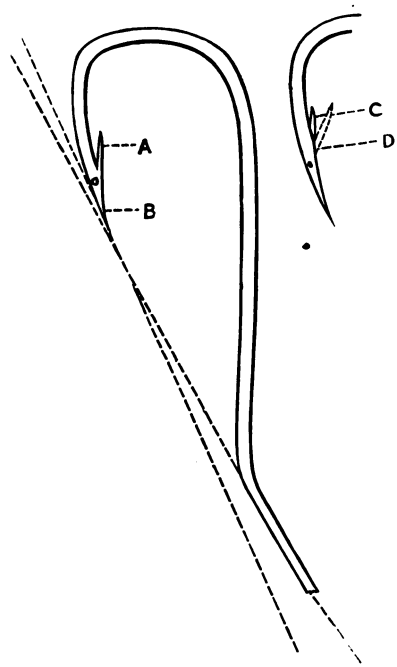

FIG. 7. HOOK WITH MOVABLE BARB.

Now there is no such a barb sold at present, but I am making arrangements with Mr. Gregory, Vyse-street, Birmingham, to produce the following hook for me (Fig. 7). Of course, it is chiefly applicable to the larger fish,—such as salmon, pike, trout, &c.; but I have no doubt it can be manufactured in small sizes. It will at once be seen that the requirements of penetration are in this device carried out as nearly as is possible, while, at the same time, the holding power is equal to anything yet before the public. The shank of the hook is bent in making, and the barb is a movable one—A and B indicate the barb and the point, which is a continuation of the hook itself; near the point it is grooved to admit of the insertion of the barb, which is a triangular piece of steel, secured by a tiny steel bolt; C indicates it at the moment of entering a fish, D shows the hook at the moment when the struggles of the fish provoke the barb. I think I may safely say that for salmon

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and like hooks, my invention is an invaluable one. Of course each hook requires to be of the best quality. I have had one, which was specially made for me, in use for six months, and it still works perfectly. Of course, the gut has been renewed several times.

Though this hook, owing to my imperfect draughtmanship, as it appears now is very ugly, it can, of course, be made in a light and elegant manner. The dotted lines indicate the close coincidence between the line of impact and the direction of applied force—much closer than in the Pennell—in fact it is almost identical.

It has been said that the shape most suitable for the single hook is, unqualifiedly the best for the triplet form used in jack-fishing. This conclusion is, without the smallest doubt, wrong; because the hooks often impact upon the fish three at a time, and, consequently, the line of the direction of force is widely different as regards the points of triplets to that in the case of a single hook. The usual shape for triplets is here figured (Fig. 8), and if the movable barb were added the best kind of triangle hook would be represented.

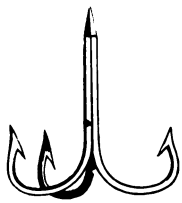

Fig. 8. Triplet Hook.

As regards the barb difficulty, I may add that there has been an attempt to get over it in America, and I give an illustration of the result (Fig. 9). I have tried a specimen of this hook, and it does not work in English waters. I missed four out of five chub, and the sixth broke the hook.

Fig. 9. American Barbless Hook.

The annexed drawing (Fig. 10) shows the "needle eye" pattern of hook, and I confess to liking it. I have had some hooks made, however, with an eye similar to C. A is the needle eye, B the method of tying it.

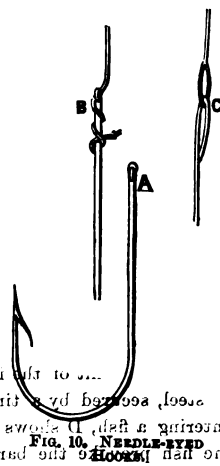

Fig. 10. Needle-eyed Hooks.

As a means of satisfying the reader that these improvements can be made without special mechanical difficulty, and with the object of offering a contrast to the directions given by Dame Berners, I will describe generally the *modus operandi* of hook making, as practised by

Messrs. Allcock and Co., at Redditch. The first process is similar to that of needle making, namely, the cutting up of steel wire into the required lengths. These are next barbed or bearded, or rather notched, then sharpened to a fine point. The hooks are then shaped and bent. They are curved on a bend by women, a very simple process, which consists of crooking the wire over a piece of hard wood. To harden and anneal the steel, the hooks go through a similar process to needles. They are hardened in the fire, and tempered in sand in a pan which is placed over a clear fire. The small hooks are put into a bag containing oil and emery, and shaken by hand to brighten them. After this they are well washed in strong soap ley to get the oil from them; and next, a most important item, they are placed in sawdust to dry. After this they are blued, once more washed, and again dried in perfectly dry sawdust, to prevent rusting. The hooks are counted, papered, and packed by girls; and it is astonishing to observe the number of different makes in vogue, as many as fifty-three sorts being manufactured at the works of Messrs. Allcock alone.

One word may be added at this juncture. Always before attempting to use a hook be sure to try its temper and reliability. Take it between a pair of ordinary pliers, and sticking the hook's point into a piece of soft wood—deal or withy—draw at it steadily. If the hook be over-tempered it will certainly fly. This is a fault which cannot be over-estimated. It often happens that the angler—roach or trout fisher, especially the latter—attaches a hook, and wonders why he scratches so many fish; in other words, feels and misses them. Let him look to his hook, and he will very probably find that the point being over hardened has broken off on striking the bony part of the jaw of the first fish the angler felt. A small needle file, easily procurable at a watchmaker's, will remedy the bluntness, though, I confess, I always change the hook, if practicable. Of course, should the fish be biting furiously, as trout do in Mayfly time, or roach under the baiting of an experienced fisherman—time means fish—and the file is a useful auxiliary.

Should the hook be under-tempered (and with the best makers of hooks both over and under-temper are inevitable occasionally), the test applied by means of the pliers exhibits the tendency of the hook to straighten under a severe strain. This is a much greater nuisance than over-temper, for if the shape of the hook be so altered as to destroy the all-necessary directness of impact, more fish will escape than would ever be the case with a blunt-pointed hook.

I have hitherto refrained from expressing an opinion as to whether the barb of a hook should be slightly twisted aside or not. Against this form of hook it may be said that the direction of force applied, and the

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direction of impact, which I insist should be as nearly identical as possible, are in a twisted hook additionally alienated. For ordinary "coarse" fishing I do not think it is an advantage at all, and therefore I never use it now, but in the case of a thickly-dressed fly it is absolutely necessary that this twist be present, because the dressing, in a certain degree, guards and protects the hook-point. If, therefore, an untwisted hook be taken sideways by a good fish, it will, in all probability, be drawn out without taking hold. A simple illustration of what is here meant may be obtained as follows:—Take two flat pieces of cork, and lay an ordinary untwisted hook between them; draw it from their midst gently, and it will be found that the point has not touched either piece of cork. This could not be done with a sneck-bend.

I think I may appropriately give in this chapter directions for tying a hook on to gut.

The whipping material is fine sewing silk, because that gives a better finish to one's work; it can be got in any colour, and it is stronger and holds better than any other material of its size. Either of the waxes hereafter given will be suitable for the purpose. When, in order to produce a nice neat appearance, it is desired to render the whipping silk almost transparent, a little of either of the waxes should be dissolved in spirits of wine, and the silk soaked in it. When wanted for use this should be taken out and just drawn through the fingers to remove the superfluous wax. A piece of deer suet or Russian tallow in a handy little box will always be found useful to obviate the stickiness of the wax, but it must not be used oftener than absolutely necessary, because it has a tendency to lessen the coherence of the wax, and render it non-adhesive, and consequently almost useless as a waterproof dressing for the silk.

I will now suppose the tyro has his materials conveniently before him, and wishes to whip his hook to gut. He first of all selects a straight and clear piece of gut without flaw, and cuts off the flat and crooked end with a pair of sharp pointed scissors (which, by the bye, are absolutely necessary to the tackle maker); he then takes one end in his mouth, and crushes it to the extent of about ¼in. between his teeth. This flattens the gut and enables him to lay it closer on the shank of the hook, and therefore to bind it with greater evenness, neatness, and strength. I should have said that the gut ought to be laid on the under side of the hook, as the chance of the binding being frayed above it is considerably decreased by so doing. He then takes the hook in his left hand, and the gut between the forefinger and thumb, and lays the gut on the shank, securing it as shown in Fig. 11. He then commences to bind, either, as in the ordinary hook, from shank to bend, or, as in fly making, as

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shown in Fig. 11, from bend to shank. The right and proper way, however, to whip a single hook for ordinary barbel fishing, for example,

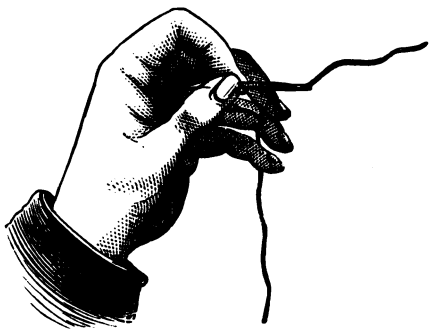

FIG. 11. SINGLE HOOK TYING.

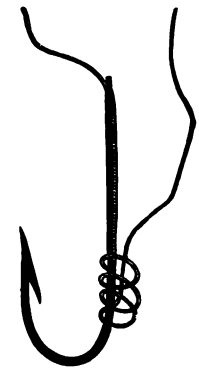

FIG. 12. FINISH-OFF OF WHIPPING.

is to commence at the end of the shank and work up towards the bend, fastening off as shown in Fig. 12. Before attempting to fasten off, it is advisable to apply a little of the tallow or deer suet aforesaid, that the thread may be drawn easily and tightly through the coils as represented, without danger of breaking the thread by reason of its sticking.

The next process is to coat the binding with a waterproof varnish, but this should not be done until the wax on the silk has hardened. When the operator judges that the wax has become sufficiently set, either of the recipes given in Chapter IX. may be brought into requisition. The varnish should be laid on not too thickly, and twice if necessary, and be placed in a warm situation to dry. Give it also time to thoroughly harden before using, and it will last as long as the gut does to which it is applied.

The amateur cannot too often practise binding his own hooks until he arrives at rapidity and neatness. A good whipper of hooks needs hardly look at his work as it proceeds under his nimble fingers. If a sort of mechanical precision be once acquired in the operation, the art of fly-making becomes easy of apprehension, if not of immediate practice. Fly making is the "fine art" of tackle making.

A very good plan in whipping hooks for ordinary bottom fishing is to tie them on a loop of gut or silk line; the superior pliability of the consequent join or hinge made in attaching such a hook to the line renders this method peculiarly applicable in cases where the wear and

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tear is great, and the bait chiefly hides the coarser connection between rod and hook.

When whipping treble hooks on gimp it is desirable to draw some of the wire off the enwrapped silk, and after wetting the silk thus laid bare with the wax solution, to fold it round and in the crevices of the hooks where they are brazed together.

When whipping gut to triplets it is advisable to just singe the end of the gut in a candle flame. This forms a knot at its end, and so very effectually prevents slipping or drawing.

Notwithstanding all these precautions, however, it sometimes happens that old hooks will draw from the gut shrinking, the cohesion between it and the binding being thus destroyed. It is advisable, therefore, in every case to first soak the articles in a little milk-warm water before testing them. A little deer suet or boiled oil may be smeared over hooks and swivels not required for constant use, and especially ought this precaution against rust to be taken when the angler is, perchance, putting his tackle away for the season.

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CHAPTER IV.

RUNNING LINES.

UNDER this head I can but briefly indicate the best lines which have come under my own observation. I cannot tell here all that is necessary for the amateur to know before he can make a line for himself. It is true there are small line making machines to be had, but no man with any judgment at all would care to compete, or reap any benefit by competing, with the line makers of Nottingham and elsewhere, in point of expense or neatness.

The old tackle makers, and those who chose to manufacture everything by hand, used, variously, hemp, horsehair, and a sort of stringy substance called *bysshus;* but the result could, in no sense, be said to approach the beautiful manufactures of to-day. Besides, they were rarely longer than the rod, and when the sort of implement, yclept an angle, resembled that used by the prioress of St. Alban's, the only procedure available on the hooking of a large recalcitrant fish was to cast the rod in the water, and seek to regain it when the attached and struggling fish might have been supposed to be exhausted.

Amongst almost all modern authorities—within the last hundred years, that is,—there has prevailed a considerable diversity of opinion as to the best material for a running line. Mr. Robert Blakey, writing under the synonym of "Palmer Hackle," recommends a line made entirely of horsehair. Of course, this might do in the absence of a better material, but it would be exceedingly expensive, and, moreover, possesses many evils, which are so considerable as to disqualify it as an effective piece of tackle. Then, in the first place, unless a trolling rod was possessed of enormous rings, it would be almost impossible to get out more than fifteen yards of line at a throw. Again, if by accident one's booted foot got across it, it would instantly sever, or be so mutilated as to be practically useless until mended; and yet, again, its power of holding

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water is far in excess of that possessed by any other material. Horse-hair for running lines cannot be said to be a success. Therefore, the only way in which it can at all be used with satisfaction is when it is compounded with silk in a taper fly line. Its lightness helps to keep up the flies, and it is easily got out on calm days.

Now, so far as running lines are concerned, there are three divisions of sport for which it is necessary to provide different kinds. The first is top water, or fly-fishing; and I will commence with a mention of the best materials. The line I personally prefer for a single-handed rod in fly-fishing is one of the length of about forty yards, well tapered, and made of hair and silk mixed; let it be a plaited line, for the twist undressed lines are very apt to kink, and hence delay and annoyance, which spoil the enjoyment, most likely, of the whole day. For windy weather a dressed eight-plait rather fine silk line is preferable, and I should think, though I have not yet tried it, that the newly invented fly-line of dressed plaited silk with a fine copper wire running down its centre is a capital piece of angling furniture. I have had some patterns of line sent me by the Manchester Twine Spinning Company, and much has been said, quite unadvisedly, as far as my experience goes, of the excellence of their creations. I have tried several cotton lines spun by these manufacturers, and I cannot recommend them. The lines hold the water long, and they swell, besides being incurable if a kink should happen by some chance to entangle them when wet. A friend of mine once procured a very, very cheap plaited cotton line from these people. It did very well for a time, but one wet day I found him vainly endeavouring to undo the Gordian knot into which it had managed to get, whilst his profanity was something shocking. Of course, I do not say that the lines will never answer, but, from my experience, I consider that the material is unfit for water wear.

An eight-plait silk line, well dressed with one of the recipes I give in Chapter IX. will be the most suitable for fly fishing. In any case, silk is the material, and nothing can beat it. The best lines I ever used I get from Mr. Wells, of Nottingham.

The same general observations apply to trolling and bottom fishing. I shall, of course, have something to say more particularly when I come to consider the appropriate tackle for every fish.

Dressings for Running Lines.

There are a number of excellent dressings in existence for lines, and for each special advantages are claimed by the inventor or user. The most simple, and it might be said primitive, dressing was a simple rubbing of the line with beeswax. Next boiled oil and ordinary boat makers'

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varnish in equal parts finds favour with several old anglers of my acquaintance; nor is this a bad dressing. The liquid should be made warm—not too hot, of course, or the line will be destroyed—and as it very slowly dries the line should be stretched in a dry warm room, and lightly drawn through the folds of a piece of washleather held by the finger and thumb to remove the superfluous dressing. Ordinarily the preparation will not dry completely in less than a fortnight, but on no account ought the line to be used till quite hard. It will be found that this dressing, though not quite waterproof, really does preserve the line very satisfactorily. Copal varnish may be substituted for the boat-makers', but I find that unless some gold size be added it is a very brittle dressing. Half and half of gold size and boiled oil is a rapidly drying dressing. White indiarubber dissolved in turpentine is, when dried (this takes some time) a thoroughly waterproof preparation. The rubber must be cut up into small chips, and a little heat should be applied to hasten its complete solution. The following is a capital recipe for waterproofing lines:

Boiled oil, 1 pint; beeswax, ¼lb. Put the oil in a gallipot and stand it in water kept boiling, while the wax is added in small pinches. Stretch and dry as before advised.

Also: ½ pint of boiled oil; ¾oz. beeswax; 1½oz. Burgundy pitch; 1 tablespoonful copal varnish. Treat the line as before after immersing it in the mixture, which should not be raised to a greater heat than is necessary to quite liquify the component parts. It is advisable to allow the line to remain in some considerable period that the dressing may quite permeate it. I have a line dressed with this recipe which has been in constant use for trolling for four years. Of course it has been redressed several times.

A line may be waterproofed by gold size and indiarubber thus: Pass a new line several times through gold size, drying it after clearing all the superfluous size away with a piece of rag. Then prepare an indiarubber solution in this wise (which, by the bye, is a splendid dressing for boots, &c.): Get a flask of salad oil, a piece of indiarubber about the size of a small apple, cut it into tiny shreds, and place these shreds in the oil in a tin saucepan. This must be heated either by water-bath, sand-bath, or the oven, for some fortnight or so, till the indiarubber has dissolved. It will be of a treacly consistence, and if either thicker or thinner than this more indiarubber or oil must be added. The line is passed into this, and hung out to dry as before. Before using, and when the line is quite dry, it is a good plan to first pass a piece of washleather, on which is smeared some palm oil, over it.

Another recipe: ¼oz. beeswax, ½ pint boiled oil, ½ pint gold size, lines

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to be steeped for a few hours in the mixture, not made too hot, and then stretched.

Also, ½ pint boiled oil and gill oak varnish; soak three days, and dry in a dry room for a couple of months.

Stockholm tar has been recommended, but I cannot endorse the recommendation. However, if well rubbed off the line as it dries, it will serve when other dressings are not available.

The following is a very good formula: Boiled oil, 1 pint; a wineglassful of gold size if you want a stiff line, and a wineglassful and a-half of copal; mix in a gallipot and place on a hob till lukewarm, remove, and having coiled your line loosely so that it can be easily withdrawn, place in the mixture. Draw out next day, getting rid of the superfluous dressing as before recommended; stretch it in a dry room, and at the end of a week repeat the process; stretch it for a month or until quite hard, polish with the least particle of deer or mutton suet on leather, and you have a capital smooth hard dressing.

The following is a good dressing for water cord or, indeed, any hemp line, and answers capitally for the spun cotton lines before adverted to in the place of the ridiculous surface dressing furnished by the makers: Put the line coiled into strong glue—½lb. to ½ pint of water, and boil for twenty minutes to completely saturate the line. Stretch till dry, then put it into a boiling solution of catechu—½lb. to 16oz. water, keep boiling for three quarters of an hour; hang up to cool for a quarter of an hour, then wash in cold water. It will be found that the line has become, as it were, tanned into a hard gold lace of leathery consistence. The catechu must be in full boil, or the glue will not set, but be extracted.

Marine glue is a capital dressing if dissolved in spirits of wine. The glue should be cut up in pea-size and placed in the spirit in a warm position for twelve or more hours till dissolved.

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CHAPTER V.

GUT, HAIR, AND GIMP.

As is probably well known to my readers, the silkworm gut of to-day is very different from the material for bottom lines of the earlier ages of English angling. An idea of the extraordinary coarseness of the tackle of the fifteenth century may be gathered from the annexed tracing (Fig. 13) from the "Boke of St. Alban's," of a ground or "rennynge" line; in other words, a line suitable for tench or roach.

Fancy insulting the understanding of a nineteenth century tench with this kind of tackle!

It is not likely that any other kind of bottom lines will extensively supplant the above three recognised materials. The tackle shown in the cut is of wire and a sort of coarse chain, which would certainly not in any case at the present day be of service for the capture of any of the *Cyprinidæ* family. I find a mention of some sort of weed being used for bottom lines amongst the older anglers, but unless this was, as indicated in my remarks on "Running Lines," a sort of *byssbus* from abroad, I cannot conceive what it could have been. There is an American importation which gardeners use instead of the strands of the old bass mat for tying plants, which is very tenuous and capable of being separated into very fine strands, but it will never supplant gut or hair, though I have used it for a fly cast ere now with tolerable success.

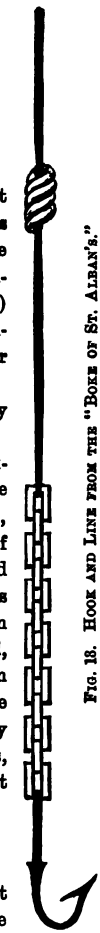

FIG. 13. HOOK AND LINE FROM THE "BOKE OF ST. ALBAN'S."

GUT.

Silkworm gut is chiefly prepared in Spain, I believe, but Portugal, Italy, and Sicily also produce it, and consists of the

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contents of the duct which furnishes the silk of the cocoon. The worm, just before it is ready to spin, is dropped into acid, and the elongated gut-like sac containing the then partially concealed *viscus* is drawn gradually and swiftly out between the finger and fixed to dry, thus stretched. Of course there are details in the preparation and treatment of the worm and its produce of which I am not cognisant. The foregoing is, however, substantially the process.

For my own part I always obtain gut in its white state, and stain it myself. The necessity for staining gut is obvious, although it can only, it is true, rest on theory and the success apparently ensuing from the use of a judicious stain. The basis of all staining is the consideration that the vegetation of the river or lake is of a certain hue, tempered by the depth of the water and general condition of the atmosphere. I say "of the atmosphere," because it is certain that if the sky be leaden and lowering even the flowers and verdure of the meadows appear less accurate in tint, or in some cases totally changed. A summer sunset glow will occasionally bathe everything in a rich glamour totally different to the actual colour of the landscape. Similarly with fish and their habitations. The stain should vary "from grave to gay, from lively to severe," according, not to the fisher's fancy, but to the exigencies of stream and climate.

The following are some capital recipes :

First, Judson's dyes may be reckoned as amongst the best and most useful of all dyes that can be used by the amateur tackle maker. Directions for using are on every bottle, and to these I can only add that a little less water than is there prescribed ought to be used for gut.

Light yellow or amber.—1½ scruples of quercibion bark, 1 scruple alum, 1 scruple cream of tartar, 16 grains of madder, 4 drops muriate of tin. Immerse three minutes.

Another amber stain. — Steep a large handful of the common barberry tree in a pint of boiling water, and let it stand a couple of hours.

Green colour or water weed.—Boil the gut in an alum mordant and then in a solution of indigo mixed with sufficient turmeric to give the characteristic green colour.

Another green colour. —Steep the gut in strong green tea for twelve hours.

Light brown stain.—Strong coffee.

Blue water colour.—Blue-black bank ink.

Bluish green.—Boil a handful of logwood in a pint of water, and add copperas until of a sufficiently deep colour. Immerse the gut, when the

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preparation is cold, until the requisite hue is obtained. A piece of copperas the size of a pea is ordinarily quite sufficient.

Light green.—Boil a piece of green baize, and steep in the liquor while it is warm.

Light yellow.—Steep in tea or coffee lees.

Red water stain.—Steep in a teacupful of black tea till of sufficient depth of tint.

All the above recipes are capital, but, personally, I prefer the bluish-green stain above given. The copperas has the effect of dulling the gloss so often seen on fine *whole* gut, *i.e.*, not *drawn*, for the latter does not reflect the light very much, owing to its less polished surface. Of course this dulling effect is just that required in trout fishing, especially in clear water. There can be little doubt that the ordinary white gut shines occasionally like a thread of silver in the sun. The angler, however, will find all the stains here given satisfactory, according, of course, to their selection being made with care or carelessness as to the atmospheric and aquatic tints before adverted to.

Gut is very easily affected by light and the dryness or humidity of the atmosphere. Light seems to render it brittle in a very short time, and I strongly advise the reader never to buy the hanks of gut he sees hanging up in the window of a tackle shop; rather let him be careful to select those that have been packed away in semi or complete darkness. I always roll up my gut in a piece of indiarubber sheeting. There is a certain amount of humidity which never varies in this sort of wrapper, which I find keeps the gut delightfully pliant. It is only necessary thereafter in splicing the gut to soak in milk-warm water. Do not however, when *tying* a hook, soak the gut, for the reason that when it shrinks again the probability is it will recede somewhat from its whipping. Use it dry and hard, and then when the hooks are soaked, as they should be always before using, the dry gut swells and renders its hold additionally secure.

Sometimes it may happen that the angler wishes to reduce the thickness of the gut he may have in his possession. For this purpose I cannot do better than give the following directions. The gut makers use a paring machine, I understand.

To make gut fine.—Steep the lengths an hour or two in a saucer containing vinegar and soft water—one part of the former to three of the latter. When sufficiently softened, take one of the thinnest lengths, make a double knot at the thinner end, screw it firmly in a table vice, and then lay hold of the other end with a pair of powerful pliers, giving a turn or two round their point for greater security. After that rub the whole length between fingers and thumb, moistened in the saucer, until

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a small portion of fur rises equally round the gut. This fur take off with a piece of dry linen, working principally towards the thicker end held by the pliers. Do this to equalise the thickness of the gut. Then recommence raising fresh fur and taking it off until the desired degree of fineness be obtained. Were this attempted at once, there would be danger of producing inequality. After wiping the gut dry with the linen, pass indiarubber two or three times over it, and polish with chamois leather, but do not overdo the polishing process. All that is required is, by a kind of spinning motion, to raise the fur equally round the gut, and to avoid "dry shaving," which would leave weak parts. After each link has been sufficiently polished, place it in another saucer, containing plain water.

Before quitting the subject of gut preparation, a few general hints on its use should be given, thus: Never tie gut until it is well softened, either in the mouth or in warm water; do not throw away the end pieces, which might probably seem of little use; some of them make exquisitely fine lengths to which roach hooks may be tied for fishing in very fine water. Finally, always soak your gut collar before using.

Hair.

Hair, especially the white, is capital stuff for tight line fishing. It is elastic, which gut is not, and if it be taken from a live stallion in good condition, very strong and serviceable. Get it at a violin bow maker's if you cannot find a live stallion of suitable colour. For long distance fishing it is, however, not suited, for I have been, I confess, utterly unsuccessful in getting good results when using it Nottingham style, with the travelling float. For the usual roach fishing it is, however, unequalled, and the chief of the London tight line "roachers" use it; besides, it does not reflect the light to the extent some gut does, and is, therefore, less visible. The same observations in reference to its use, as given in the case of gut, are applicable to horsehair.

If it be desired to dye horsehair, the grease must be first removed by soaking the hair in some mordant. A good mordant is made for this purpose, and, indeed, for dyeing feathers, by dissolving a quarter of an ounce of alum in a pint of water, and boiling the hair or feathers in it for a little time.

Gimp.

It is a very difficult matter to get good gimp, and as I am not personally acquainted with any wholesale maker, I can only refer the reader to Mr. W. Hearder, Union-street, Plymouth, from whom I have had some good samples now and again. There are various sizes, as

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the cut (Fig. 14) will testify. These are the gauges of the gimp supplied by Kennings, of Little Britain, London, and I am not aware if different gauges are in use by other makers. For river and lake fishing the angler seldom requires it of greater gauge than 00, or 0 at the largest; whilst for ordinary spinning purposes I have found 000 to be quite thick enough, *i.e.*, if it be of pure silk and new. Too often it is of nothing but cotton and silk mixed, with a disgraceful percentage of the former. In such case it is soon rotten, as the angler finds out to his cost some fine day, when, after playing a good fish, he suddenly finds himself minus fish and hooks. "Ah!" he probably exclaims, "he bit it in half." Don't you believe it one time in ten; it is the inferior gimp that is to blame.

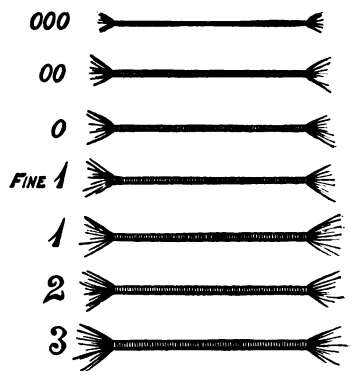

FIG. 14. GAUGES OF GIMP.

I remember an instance of this which annoyed me extremely. We were fishing at Tring reservoir, and the sport had been extremely indifferent. Considering the water was snow broth, this state of things was perhaps to be expected. Anyhow, nothing in the shape of fun had gladdened our eyesight, till I, fishing with a live bait, announced the disappearance of the float. The usual time had elapsed for gorging, and I reeled up and struck. I hit a good fish, and succeeded in getting him in sight, when on seeing us he made an extra plunge, and away he went. I inspected the gimp—quite new it was—and found the villainous cotton strands had rotted. The silk had broken much less cleanly, but the cotton mixed with it had snapped like a carrot. On trying the remainder I found the same thing occur—yet this was obtained from a very respectable tackle maker whose *cheap* goods I had never before found *nasty*. Moral, always test, by pulling, the gimp you buy. I prefer the silver gimp to that of a yellow colour, because it takes a stain much more readily.

Now, it is next door to insanity to use unstained gimp for any purpose. Of course I am aware that a hungry pike will generally rush at anything in the shape of food, and if a cable and chain like the tackle shown in Fig. 13, were baited with a glittering dace, *Esox Lucius* would be "on" under certain circumstances. But in waters where these fish have been

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educated, as in the Thames and most of our public waters, to look with suspicion on the lines presented to them, they ordinarily would use sufficient self control to prevent their own capture by such means. Bright gimp cannot but be, in bright water especially, very apparent even to the thick headed dulness of a jack's eye as something quite unusual. I do not go so far as to say Master Jack holds a monologue with himself after this fashion: "Ha, ha, that gimp connects this fine fat dace with that chap in the punt," but I do believe that fish are deterred by anything unusual from following uninterruptedly their food-getting instincts. Hence, I would say, even as you stain gut, dull the glitter of your gimp. For that purpose, bichloride of platinum or sulphide of potassium is recommended as a good stain; a solution of about one part of either to ten of water. "Don't make it too strong," wisely says Mr. Francis, of the bichloride, "or it will rot the gimp." So I should think; let the angler try twenty parts of water instead of ten, and afterwards wash his traces under the pump thoroughly. This is a capital dulling stain, however. I have also used a very weak solution of hydrochloric acid with advantage, one part to about thirty of water.

Gimp should always be tried after it has been put away for any length of time, for this reason. The better the gimp the closer the strands of wire are wrapped round the silk core, and as the water nevertheless inevitably enters and soaks the core, unless gimp is summarily dried before the fire, it retains the moisture a considerable time. A chemical action is often set up in the metal, and this has a rotting effect on the fibre immediately enclosed by it. If possible, therefore, lay the hooks and gimp after use on a warmed plate so as to dry them at once.

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CHAPTER VI.

REELS AND WINCHES.

REELS or winches are usually made of either of two materials, metal or wood. Sometimes, however, ebonite or vulcanite is used, and I have seen some very pretty productions from the latter material. Wood, however, either box, teak, mahogany, holly, or yew, is usually utilised for Nottingham reels, and brass or gunmetal does duty for the winches.

I will first consider the latter. Winches are, according to their mechanism, either plain, multiplying, or check, alias click or cleek. Of course, the former simply is a reel on which the line is wound, and, bar the fault that it is apt to overrun, it is not easily got out of order, and if made with a large hollow axle is useful enough for ordinary purposes.

The multiplier, which is now passing deservedly into oblivion, depends, as its name implies, upon the action of cogs, by which each turn of the handle sends the axle, on which the line is wound, round from twice to six times, according to the mechanism. It has many faults. True, when in good order, it will wind in very quickly; but what is gained in speed is lost in power, and I have never been able, in a satisfactory way, to wind in a big fish with it. Besides this, it is incorrigibly precarious —more often out of order than all right. The cogs, if of brass, wear out, causing the dead points of the handle to be frequent and exasperating, and if they be of steel they rust and will not go on at all. Taken altogether, of the metal winches the plain "check" is the best.

The mechanism of this simply consists of a steel tooth, which acts on a cog connected with the axle of the winch so as to regulate its speed. If, therefore, a fish insists on taking out your line with a rush, he has no chance of doing so and overrunning the reel, as in the case of the "plain" winch. The tooth prevents this, and gives no entanglements. You may make your mind easy that the provoking result of an overrun line will

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not occur. Of course this is its only advantage over the old-fashioned winch, but it is a very great one.

Now, in brass winches—in fact all winches—there is a danger of the line getting fast round the handle, if there be one. I never use one on a Nottingham reel, but one is necessary on the "check," because my handleless arrangement—to be detailed, and belonging to my Nottingham reel—cannot be applied to a check winch, because of the superior difficulty of moving the latter. In order to obviate the handle nuisance, one of the following shape (Fig. 15) should be always used, and the nuisance vanishes.

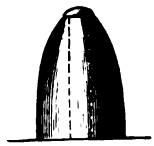

FIG. 15. HANDLE FOR WINCH.

It will be seen that it is cone shaped, consequently no matter how wet the line is it is not likely, if the handle be of polished agate or glass, or even ivory, for a disastrous entanglement to take place. Especially is this a secure handle if it be counter-sunk in the plate of the winch.

As to another evil which is incident to all makes of reels—viz., that of the line getting round the reel itself—there is, as far as I know, only one cure, and that has been adopted by Mr. Pennell. Its simplicity will recommend it. It consists only of a steel spring placed as in the following diagram (Fig. 16).

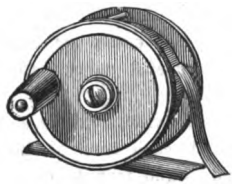

FIG. 16. WINCH, WITH PENNELL'S LINE GUARD.

The wooden reels are now made with a great degree of neatness. One in my possession at the present time has a check applied and an arrangement which throws it on and off as desired. By touching a button also the box of the reel comes away from the axle, and thus if by any chance the line or anything else interferes with the free running of the reel it can be detached and corrected. This reel is termed a "spring reel," and is the invention of one of the Nottingham makers I have before spoken of—either Bailey or Wells, I do not remember which. It answers every purpose capitally, but care must always be taken with these wooden reels whilst fishing in the rain. No matter how well seasoned the material may be, they are sure to absorb wet, and consequently are certain to swell. Of course, therefore, on shrinking they are prone to return to a different shape, thus destroying running power, and often entirely and irrevocably spoiling their free movements. The only remedy is a good coating of varnish, and the invariable manufacture of them with cross bars of metal riveted to retain the wood in its original and desired position.

In addition to even this improvement I have devised a remedy for the

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evil handle, which, whether it be cone-shaped, as advocated for a winch, or of any other shape, is, when one is fishing with the Nottingham rod and line, a nuisance. I am sure that what I call an improvement will be endorsed as such by the majority of "Nottingham" anglers. It has, moreover, answered every purpose to which I have put it when a fine line was desirable for use. Of course it will not do for jack-fishing, as will be instantly seen when I mention what it is. If any angler pooh-poohs it, I have still the consolation of believing that there are a few who can use Nottingham tackle in its entirety of excellence and resource. Perhaps I am one of those who can, and hence my unqualified praise of my own invention for doing away with handles on a reel designed for "fine and far-off" fishing.

The whole thing consists in sinking a couple of studs with line-crossed surfaces in the parts of the reel originally occupied by the handles. These studs turn on a pivot of steel. On striking a fish one's right hand, of course, is on the movable circumference of the reel, and when it is necessary to wind up line—or "reel up," as it is termed—a smart blow is struck on this circumference. Sometimes, however, it is necessary to use force against, say, a chub. This being the case, the forefinger slips at once into one of the recesses referred to, and *upon the stud*, which turns with the finger. The line can then be as surely wound up as if the forefinger and thumb were employed on a handle outstanding from the reel. The advantage of the arrangement is that no matter how the fish rushes, there is no possibility of the line being entangled round a handle. Many a good fish has been lost through such an event as that.

A very practical angler of my acquaintance once objected that it was impossible, with the device I have just referred to, to wind up quick enough supposing, for example, that a chub of weight made up his mind to speed up-stream and shorewards, as is the wont of this fish during the first moments of affright. This was but a theoretical objection, however, and I only mention it because some of my equally practical readers may be inclined to take a similar view. In answer to the objection let me say *I never experienced such a difficulty;* I am, moreover, an inveterate chub-fisher. Howbeit, as I egotistically before suggested, perchance I am exceptionally dexterous in the management of the tackle.

Supposing the reel to be affixed to the butt of the rod, I will add another little hint which may be of use to the angler. Render the right hand side of the reel, where the studs or handles are, as light as possible by thinning it, or employing tin, or some other suitable metal or wood. You will then be able to throw a couple of swan shot on your line a distance of fifteen or sixteen yards without difficulty. Ordinarily this part of the reel is so thick and heavy as to almost preclude the casting of a small weight to any distance.

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CHAPTER VII.

FLOATS.

HERE are Dame Juliana Berners' directions for float making, and, besides their curious quaintness, they substantially state the making of cork floats:

"Thenne shall ye make your flotys in this wyze. Take a fayr corke that is clene without many holes, and bore it through wyth a smalle hole yren. And putt therin a penne juste and streyghte. Ever the more flote the gretter penne [*i.e.*, a quill] and the gretter hole. Thenne shape it grete in the myddis and smalle at bothe endys and specyally sharpe in the nether ende, make theym smothe on a gryndyng stone or on a tyle stone."

Thus the "Boke of St. Alban's." But similar to the art of rod making is that of float making. Experts can make them much quicker and better than an amateur, unless a quill, one of the best and most serviceable of materials, comprises the whole bag of tricks.

I append drawings of some floats most in use at the present time, with one of my own device. Nos. 1, 2, 3, are travelling floats, as their position indicates, No. 3 being loaded so as not to require additional weighting. Nos. 4 and 5 are the ordinary roach fishing floats. Nos. 7 and 8 represent the side and front views of a float I make out of deal. It is exceedingly light, and is a capital float for chub fishing. No. 6 is the ordinary live baits' float for pike.

No. 1 is commonly of cork, though I have constructed it of tin hollowed. This makes a capital substitute, only it is a difficult matter to solder the tin so that no water gets inside. I have also made this sort of float of pith, and of indiarubber blown out with hydrogen and protected by strips of quill. These fancy floats are, however, only fit to occupy lazy time, in the making, for the cork float is quite the best material after all. Having bored through your strip of cork with a red hot iron, or, better still, a cork-borer, used in chemical experiments (it

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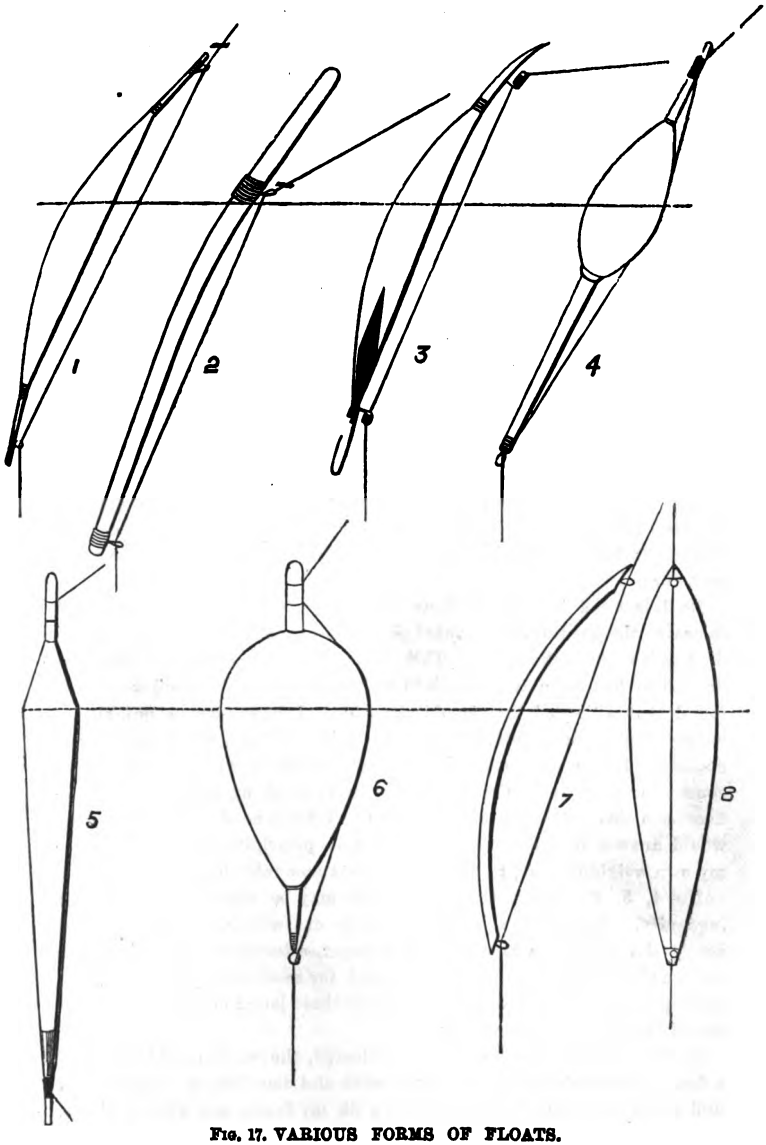

Fig. 17. VARIOUS FORMS OF FLOATS.

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can be got of Jackson and Townson, Bishopsgate-street Within), fit the quill with some shellac varnish inside the cork. Of course you regulate the size of the hole by the quill, and *vice versâ*. The quill may either be a "penne" of goose, or swan, or porcupine. The latter is more solid, and I prefer it. Having fixed it tightly, whip some well waxed silk round the upper and lower ends of the cork. Then proceed to put on your rings, both top and bottom. These rings may be made by straightening some ginger beer wire, drawing it through the thumb and finger, protected by a piece of wash leather, and then rolling it round a piece of iron wire of the thickness required to form the diameter of the desired ring's interior. A pair of pliers at once arranges the two ends, and a sharp file brings them flat and ready for whipping on in the position shown in the engraving. This method of ring making answers for all the floats.

No. 2 is a quill from a swan, goose, Muscovy duck, or turkey, and it is always desirable to thoroughly *dry* such a quill in a gently heated sand bath or oven. Then it should be scraped, and at the junction of the feather and quill a little sealing-wax varnish should be applied, because in stripping the feather off it sometimes happens that a tiny hole is made in this, the tender part of the quill. Proceed as regards rings as before.

No 3. is a self buoying float, and the black drawing in the lower part indicates the position of a pointed plug of lead, designed to just cock the float as it rests in the water. This kind of float is very useful when it is desired to fish for carp or roach in rather shallow water, and when it is found that a leaded line is objectionable. I have seen a quicksilver weighted glass float, brought out by Major Colburn, which is also self cocking. It was supposed to be of toughened glass, which would sustain concussion without breakage. However it fell off my mantelpiece to the floor one day, and shivered to atoms. I have no doubt such a float would answer if made in a quill; the same principles however regulate my own weighted float, to which I was just now referring.

No. 4, 5, 6 explain themselves, and may be made by anybody of ingenuity. The cork should be roughly cut with a sharp knife, and neatly shaped with a rasp and glass paper afterwards. No. 5 can be fashioned of soft deal, and finely pointed for roach-fishing if so wished, or of quill or even reed varnished. Both these latter materials are most unsatisfactorily fragile however.

Nos. 7 and 8 represent, as before indicated, the front and side views of a float I make out of deal, and use in chub and dace fishing. I paint it a dull green below, as, indeed, I always do my floats, and whitish above. It then represents more nearly, as far as the submerged portion goes, a

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rush or reed; as far as the upper is concerned a feather or white underside of a withy leaf. When my other larger and more stalwart floats scared the wary chub in midsummer, I found this float enabled me to do execution.

Notwithstanding, however, that I thus describe the typical makes of floats, I am free to confess that they are at the best but necessary nuisances. There is no doing without them, I know, but they should always be used as light as possible, especially in mid-water fishing. A piece of lucifer match, a leaf or feather, anything when fishing for timid fish, is better than a gaily painted and ornamental float. Of course, if one is fishing deep water, as in "slide corking," there is a positive benefit accruing from the use of the float, because one cannot possibly compass so much ground or water by any other means. This is negative praise of it, however.

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CHAPTER VIII.

KNOTS AND TIES.

KNOTS and ties comprise a subject of vital interest to the angler who systematically intends making his own tackle, and I must therefore be pardoned if I refer to the subject at some length.

Perhaps the method of tieing two pieces of gut together had better be reverted to first.

Take the two ends of the gut (previously softened) and lay them side

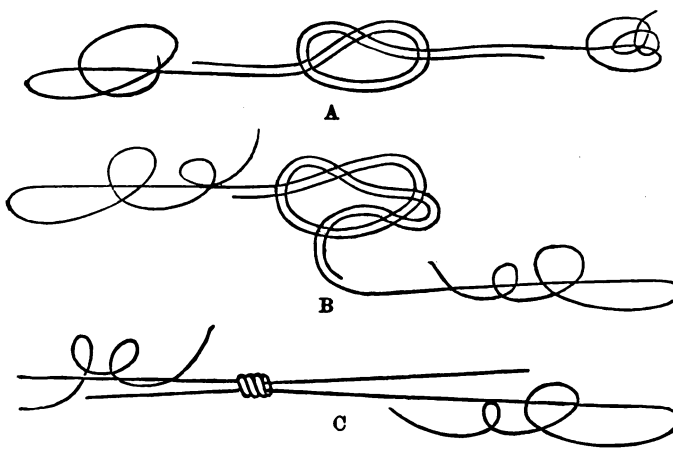

FIG. 18. METHOD OF JOINING LENGTHS OF GUT.

by side, holding them with the left forefinger and thumb so that the ends lap over at least half an inch. Then with the right hand form a loop of the two to the right, pass the ends through as A (Fig. 18), and again

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through (see B). Then, after wetting the loose knot, take the ends again in each hand, and draw tight. The knot which results will be as represented in C.

The following knot (Fig. 19), is one which answers capitally for the

FIG. 19. DOUBLE HALF KNOT.

attachment of the dropper to a casting line. The figures are from Mr. Pennell's book, though the knot is as old as the hills almost; anyhow, I remember it as long as I can remember, and so does my father as long as he can recollect, To quote Mr. Pennell's lucid explanation, however, this is how it is tied: "Take the casting line in the left hand a little above the intended point of junction, thick end [or reel line] end upwards, then with the other end make a knot round the casting line in the form shown in A, Fig. 19; then draw it tight and push it down to the next main line knot below. B, Fig. 19 shows a different view of the same knot.

Fig. 20 shows the fisherman's knot loosely tied. The method of tying it is in this wise: Take two ends of line between the finger and thumb of the left hand; thus the main line and one end is to your right. Now take the short end of these two between finger and thumb of the right hand and pass it down, under, up, and through. Reverse the position of the line in the left fingers, and repeat. Pull the two knots shown in Fig. 20 tight, and draw them together by gently, but strongly, pulling the main lines: the result will be as nearly as possible

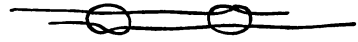

FIG. 20. THE FISHERMAN'S KNOT.

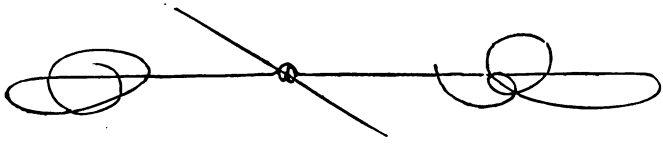

FIG. 21. THE FISHERMAN'S KNOT TIGHTENED.

like Fig. 21 in neatness of appearance and strength. After pulling the knot quite tight the ends may be snipped off closely.

There is a double fisherman's knot which is made by taking one more

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pass of the line round, under, and through, as in the left hand knot (A) of Fig. 22. The result is a harder and larger and—possibly, but I am not certain—a surer knot.

In making up a salmon or trout cast, when the joining knots are being tied, it is often as well to include in one or more of them the droppers. Fig. 22 shows how this may be done without the possibility of their drawing.

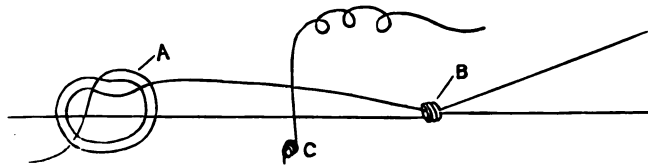

Fig. 22. Fixing Dropper on Flycast.

A is a half of a double fisherman's knot, of which B is the other drawn tight; A is shown loose that its structure may be readily perceived. C is the knot of the dropper. When A is drawn tightly up to B, the dropper gut is enclosed between the two knots, and, if the gut be properly tested, it will be found that C cannot escape. The entire knot can be easily loosened, but not drawn.

There is yet another knot which seems almost as useful as the foregoing for attaching a dropper, and it consists of two half hitches passed round the main line. The end of the dropper gut, of course, has a knot tied as in Fig. 22.

It has been sometimes found that a sudden strike will break the most reliable of knots. This is because the gut, often getting dry, and its constriction not having been loosened by the water, the sudden strain is too much for it. To obviate this, the following represents a double fisherman's knot, *not drawn tight*, except so far as each half knot is concerned. Between the two half knots waxed silk is whipped and varnished. The remedy is a perfect one without question, but it renders the gut line unsightly, and liable to be noticed by the fish, and is, therefore, objectionable on that score. The idea is to be seen in Fig. 23.

Fig. 23. Fisherman's Knot with Whipped Interspace.

Of course the whipped interspace can be much more limited than is shown in the engraving, as such limitation may be thought desirable.

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As a rule, however, this knot is only useful in the make-up of gut salmon, trout, and pike traces for spinning, where the strain is sudden and forceful.

Having thus given the various methods of tying and joining knots, I proceed to illustrate the most symmetrical and reliable loop of which I know.

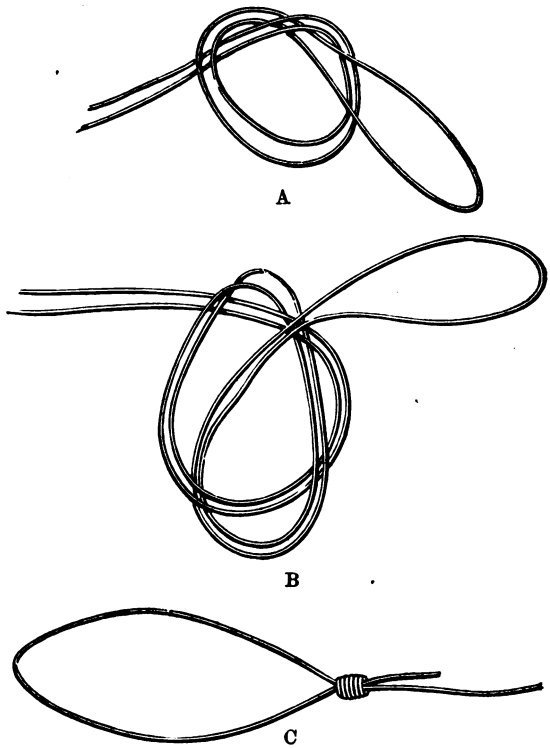

FIG. 24. LOOP FOR COLLARS.

Fig. A represents the first movement, B the knot loose, and C the knot when drawn tight.

There are, of course, various other ways of tying a loop, but I do not think any other can equal the method I have given.

To explain the making of this loop more fully, I may say that a loop is formed in the end of the line of considerable dimensions, and the ends

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held between the forefinger and thumb of the left hand. The loop is then turned with its apex towards the left hand and taken round, over, under, and through (see A). This process is again repeated (see B), and, finally, the finger and thumb of the left hand still grasping the end, the right forefinger is placed in the loop, and the whole is drawn tight (see C). It is one of the easiest knots to tie, and the surest. The loose end can be cut close to the knot without fear of drawing.

All sorts of ties, including slipknots which nobody can undo, are made by the inexperienced when attaching a bottom line to the running line.

The way to attach the loop of gut or gimp, *et hoc*, &c., to a line is shown in Figs. 25 and 26, and needs little explanation.

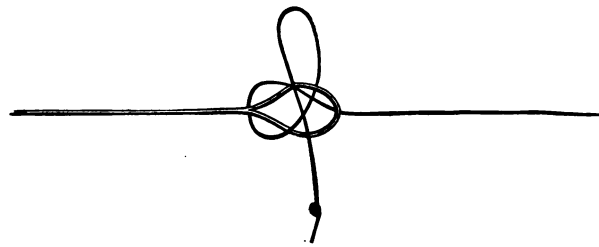

FIG. 25. ATTACHMENT OF LINES TO COLLARS, &c.

In neither case is it possible for either line, trace, or cast to draw, whilst they can be undone in a minute, no matter what strain has been put upon them.

This is how Fig. 25 is tied: On the left hand is the loop, terminating the gimp trace, on the right is the running line, terminating in a knot. Take the former in the left hand, pass the knot under the apex of the loop over to the right, under to the left, over to the right, and under the opposite part of the loop, bring it up, pass it over the right side under the crossing line, and over the left side of the loop; pull tight, and nothing can draw the tie by mere pulling. When this knot is desired to be released, take the knot between the teeth and pull; the whole thing comes undone.

FIG. 26. ANOTHER MODE OF ATTACHMENT.

Fig. 26 is tied without the bow, and is "simplicity itself"; the engraving will explain.

Let it not be thought that the whole subject of knots and knot tying has been here exhausted, or that the author fancies so. Those given are quite sufficient for ordinary purposes, however, and the angler will soon, as he progresses, learn others more ornamental, if not more reliable.

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CHAPTER IX.

WAX AND VARNISH.

WAX and varnish of one or two kinds are absolutely indispensable to the tackle maker, and I therefore now proceed to give a few recipes for each.

White Wax.—Take 2oz. of resin, and ½oz. of beeswax, and simmer them together for ten minutes in a pipkin, then add ½oz. of tallow, and simmer for ten minutes more. Pour out and work with the fingers till cold.

Colourless Wax.—The following is a recipe of Mr. Haigh's, of Glasgow, who says at the same time, "Waxes containing tallow or grease of any kind should never be used for fly tying": Take 1lb. of clean resin and melt it over a slow fire, add to it 4oz. of diachylon, stir them gently with a stick till thoroughly incorporated. Then empty the wax into a bucket of clean cold water, and when cool enough to handle pull it between the hands for about twenty minutes. The more it is pulled about the brighter it will become.

Cobblers' Wax, suitable for tying ordinary hooks, can be made as follows: Take 2oz. of best yellow resin, in powder; add 1 drachm of white beeswax, sliced in minute pieces, put it in a small jar or pipkin, which place in a saucepan of boiling water, taking care the water is so shallow as not to mix with the resin and wax (or the jar may be placed on the side piece of a grate), with a bit of stick stir till the resin and wax are dissolved perfectly, then add 2½ drachms of best fresh lard, and let the whole simmer for ten minutes, stirring often; pour into a basin of cold water, and whilst warm pull the wax and knead it with the fingers till nearly cold to give it toughness. Make it into small balls, which place on a piece of window glass in a small box to keep from dust; to be kept in a cellar or cool place. Another very good recipe is: Tallow resin, 23 drachms; beeswax, 13 drachms; and prepared suet, 2½ drachms; melt together. When using either of these compositions it is necessary

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that the minute pieces of wax necessary to wax the silk thread should be warmed and rendered sufficiently soft, or constant annoyance will be experienced in consequence of the silk breaking.

Gum Mastic Wax.—A saturated solution of gum mastic in methylated spirit makes a good wax for whipping hooks, rods, &c.

Green Spirit Varnish, very useful for colouring rods for fishing amongst weeds, is made with green sealing wax and methylated spirit. Break the wax into small pieces, and allow it to dissolve in a warm room.

Orange Varnish.—This may be made by mixing the following ingredients: Spirits of wine, 3oz.; orange shellac (crushed), 1½oz.; gum Benjamin (benzoin?), ½oz. Allow a week before using.

Colourless Spirit Varnish.—Bleached shellac and methylated spirit, with a little gum Benjamin added.

Brown Varnish.—Ordinary shellac dissolved in spirits of wine. It dries quickly, but must be used in a dry atmosphere.

Indiarubber Varnish is made by heating linseed oil and the rubber in a sand bath till it is dissolved. This varnish takes a long time to dry.

Copal varnish, with small quantity of gold size and turpentine, takes some time to dry, but it makes a good whipping wax. Steep the silk in it.

Another wax. Tallow and resin each 23 drachms, beeswax 13 drachms, mutton suet, free from skin, 2½ drachms, melt together.

Now all these receipts are good according to their various proper uses. I prefer the cobblers' wax to any other for hook whipping, however, and the plain shellac varnish for rods. I have used all, and found them, according to circumstances, capital recipes, and I therefore invite the angler to make and try each one as required. I could have lengthened this chapter greatly, by adding ancient and, for the most part, comparatively useless notions, but such are not of more worth than curiosities to the modern practical angler; I refrain, having no doubt the foregoing will be found sufficient.

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CHAPTER X.

TACKLE FOR SPINNING AND TROLLING.

In this chapter I throw the *Esocidæ* and *Salmonidæ* families together, because the applicability of the principles and designs of certain portions of the tackle used in their capture extends equally to each member of both families. Thus for example, a spinning trace or flight for pike will, so far as principle and design are concerned, serve for the capture of a sea trout or salmon. Similarly with but slight alteration of detail, and none of principle, a salmon fly will take a pike, although not unfailingly it must be said.

Spinning and trolling are commonly included in one category, because, as before explained, the verb "to troll" simply is from the French *trôler*, to lead about. Spinning explains itself to the initiated, and to the uninitiated I may say it implies the use of a bait that spins. All this may seem redundant, but as so many words in the English language, though professing to show their meaning, nevertheless do not, I am constrained to descend to such simple exposition.

Spinning and trolling in ordinary practice consists of the use of the spinning bait and the gorge bait. The former spins as intimated, the latter does not, but is worked with a sort of "sink and draw," motion explained in the chapter on Pike. I shall commence with the former of the two.

Spinning.—This style of fishing requires the same principles throughout for both pike and the *Salmonidæ* the difference in the tackle simply consisting of variations in size.

Naturally the first consideration is a selection of the best arrangement of hook for the impalement and retention of the bait, the proper gyration or spin of the same, and the most certain capture of the fish which seizes it. Now, what is the best arrangement?

In order to answer this question it is necessary that the reader should see the old fashioned, and even now much used, Thames flight (p. 415).

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As this drawing is one of mine, it is, of course, not quite exact, but nevertheless sufficiently near, and, as will be seen, consists of four triplets, a back hook, and a lip hook. When writing on Pike, at p. 159, by inference I questioned the demerits of this Thames flight and the merits of Pennell's arrangement, shown on opposite page. Since that was written I have considerably modified my views, in consequence of careful and minute experiment, and I find that the evils of the Thames flight briefly are as follow:

(1.) The difficulty of fixing the hooks on the bait, in the fish's mouth.

This may need explanation. Let the reader suppose a brush of needles, instead of bristles, with their points turned upwards. Further that he places his hand upon these upturned needles. It will be found that *no moderate* amount of pressure will suffice to force the points into his hand. If, on the other hand, he denudes this imagined brush of all but say two or three of its needle bristles, any experimentor who cares to be so foolish, can, by the exertion of the *smallest* force, pierce his hand with the remaining points. The application of this is apparent. A great amount of force is necessary in the strike of the spinner to force the many hooks in the flight before us over the barbs. Whereas, if these points were reduced in number, a comparatively small amount of exertion would be necessary. It is therefore evident that the Thames flight errs because of the number of its hooks.

"But," the critic may answer, "the number of hooks increases the chance of hooking, because of the number." So it would, were it not for the former argument. A pike takes these many triangular hooks between its bony jaws, and holds tight for a second or two. If the angler then strikes the many points cannot pierce both because of the reason urged, and because of the fish's strength. What is gained in number is lost in certainty. Therefore the desideratum is a flight which will give the highest percentage of captures for the strikes or bites of the fish.

(2.) The second evil is the rapid destruction of the impaled bait, and consequent increasing deterioration.

The bait is pierced in many places, and the curve of its tail is arranged with comparative insecurity. Hence, it very soon loses its symmetry, and becomes water-sodden and soft. The force with which it falls on the water and other accidents then act upon it with a severity increasing with great rapidity, until it is utterly unfit for use. It therefore is soon spoilt, and is in nine cases out of ten unusable if a fish touches it with its teeth only, and is in consequence not caught.

(3.) The third evil is the insecurity of the lip hook, and the consequent "doubling up" of the bait after a little use.

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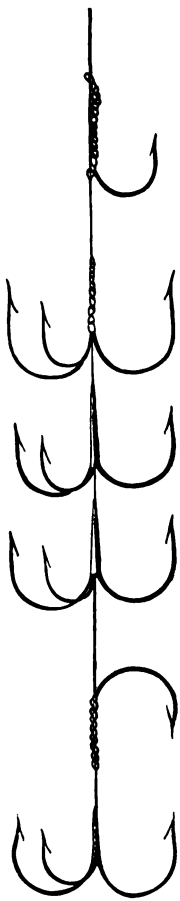

FIG. 27. THE THAMES FLIGHT.

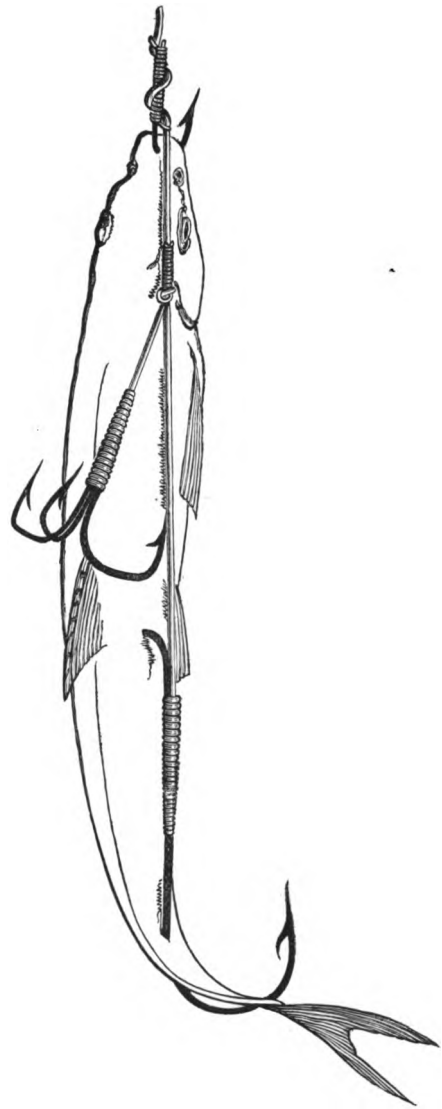

FIG. 28. THE PENNELL FLIGHT.

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This of course, destroys the true spin so essential to successful pike or other fishing, rendering the bait unsightly, and accelerating its destruction.

A great many of these detrimental features are done away with by the "Pennell" flight as figured. Upon its results I have not, though I have tried often with various dodges, been able to improve, and I unhesitatingly, without a word for the designer, whom I do not know personally, pronounce it *the* best flight yet made. This is after testing it in every conceivable fashion.

As will be seen the bait is in *situ*, and each of the objections to the ordinary shaped flight is done away with. Occasionally, according to choice, another triangle hook is added, but I do not favour this. Pike always, or nearly so, seize the bait by the centre—here is a triplet to meet him. If this does not hook him, the large tail hook does so ordinarily outside the jaw. The single hook cannot, as may be seen, tear out, because it goes right through the vertebra of the fish. The lip hook is also greatly improved.

The cut represents the flight baited, showing the lip hook fixed. A little attention to the subject of lip hooks may here be opportune.

Fig. 29. Ordinary Lip Hook, Unsecured.

The old-fashioned lip hook was usually, like Fig. 29, constructed by whipping two loops of gimp or gut on to the hook, and sliding the flight gimp through them. In order to keep it in its place on the gimp, the device shown in Fig. 30 was resorted to, which briefly implied twisting the gimp round the bend of the hook. This was of course a sufficiently secure method, but, liable to innumerable inconveniences, as every jack-fisher knows, not the least being its agency as a cause in the rapid deterioration of the bait, either by reason of the coils becoming unwound, or by reason of its abnormal position bending the head of the bait on one side. A newer style subsequently came up, which substituted metal loops for those of gimp. This admitted of great inconvenience, as is patent from the annexed drawing (Fig. 31).

Fig. 30. The Ordinary Lip Hook, Secured.

This inconvenience was chiefly a greater danger of the bait "drawing," owing to the position of the loops, than in the older style,

Fig. 31. Lip Hook with both Loops one Way.

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and it was generally found necessary to twist the gimp round the bend of the hook as in the earlier patterns, in addition to the coils already formed on the shank. Mr. Pennell's pattern is as shown below (Fig. 32), and simply because of the line impinging with greater obliqueness on the loops, which impinging is due to *their* obliqueness, it is found that the hook is practically immovable, unless the angler moves it. This is a specimen of ingenuity in small things, which I consider to be the chief excellence in Pennell's flight.

Fig. 32. Pennell's Lip Hook with Oblique Loops.

It is true that knowing the imperfections of both the previous makes I had endeavoured to improve on their holding power by the device shown in Fig. 33.

I tied the lip hook on first, when constructing the flight, at the extreme end of the gimp or gut, I then whipped on a couple of loops, as in the earliest lip hook shown. The other end of the gut was then turned and passed through these loops (forming a large loop as indicated in Fig. 33), and to it were then attached the hooks. By this arrangement, the lip hook could be adjusted whenever it was desired, and the large loop to which the trace was to be connected, when tied or affixed otherwise to the trace, retained the lip hook in its place. The greatest objection to it was the double thickness of gimp or gut just near the bait, and its consequent clumsy appearance. Otherwise it worked well, and as will be seen its principle is better than that of Mr. Pennell on a minnow trout trace hereafter to be shown (p. 422).

Fig. 33. Improved Lip Hook.

The next best flight for the safe hooking of pike, &c., is shown on next page (Fig. 34), and explains itself so far as its construction is concerned. In order to render the baiting of it intelligible, however, I will describe the whole thing. A is a small triangle hook drawn down to the bends of a large brazed triangle (B). C is a triangle which sustains the fish in position after it is placed *in situ*. Now as to baiting, C is not, of course, in the loop, when the angler takes a baiting needle and attaching it, passes it *in* at the vent of the fish and out at the mouth, drawing the gimp till the large triplet (B) is stayed at the vent. He then arranges the bait straight, and fixes the triplet (C), either in the mouth or so securely in the fish as to keep it in position. Triplet A is now fastened into the bait's tail in such a way as to give it an eccentric twist, the precise fitness of which can only be hit upon by trying it before finally fishing with the bait. At the best the gyration is but a modified "wobble"

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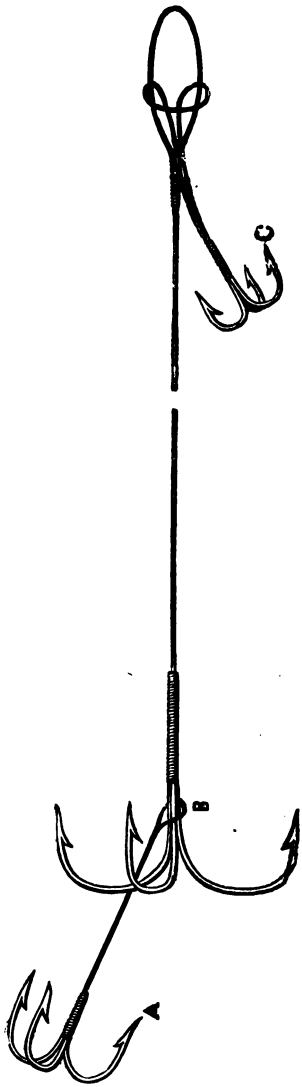

FIG. 34. IMPROVED SPINNING FLIGHT.

as compared with the brilliant even spin of a Pennell baited tackle or that of a freshly baited Thames flight. Nevertheless this "wobble" is very attractive, and I am not sure it is not preferable to the perfect spin of the "Pennell" flight. As to the hooking powers of the tackle I can only say that I once took thirty-seven fish and lost only one when using it.

The reader will, of course, notice a break in the gimp shown in the engraving. It should be here stated that this gimp ought not to be more than nine inches in length from the largest triplet to the loop. Of course, the additional triplet (C), is of various sizes in the angler's basket, and not arbitrarily as shown in the engraving, or it will be found to be unsuitable in some cases, because of shortness of gimp and insufficient size. Both these disabilities are, however, not over-necessarily important, because the hook in question is not meant to directly hook the fish, but simply to hold the bait in the first place. Of, course, if, on the off-chance, a fish hooks himself on the disengaged hook, two out of the three are supposed to be employed in firmly holding the bait—so much the worse for the fish.

The manner in which a pike usually takes a bait is crosswise in its mouth. Now, this tackle, in nine cases out of ten, hooks a pike from *outside* by reason of the large triplet not being *in* but outside the jaws. Of course, in the case of trout this doe not occur, this fish being generally hooked by the tail or shoulder triplet.

I do not quite know who was the inventor of this species of tackle. I can, however, confidently say that it deserves better recognition than it has hitherto received. Of course, the device of putting to it an

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additional triplet near the head of the bait is mine, and a great improvement it will be seen to be, if any of my readers care to make the flight up and thereafter adjust a bait upon it. I found on using the tackle without this addition that, after a time, the water entering the mouth and stomach of the bait, and passing through the vent, very soon rendered it sodden and, of course, soft. Indeed, this deterioration cannot be avoided, but the *result* can. The soddening of the bait allowed it to bend and warp in a most unattractive way; in fact, it was not an uncommon thing to see an erstwhile firm and glistening dace in a few minutes reduced to a sort of Quasimodo of fishes. It follows necessarily that the bait was of no, or very little, use afterwards. The addition remedies such demoralisation, and retains the fish in its place, if firmly adjusted in the shoulder, mouth, or any other part near the head.

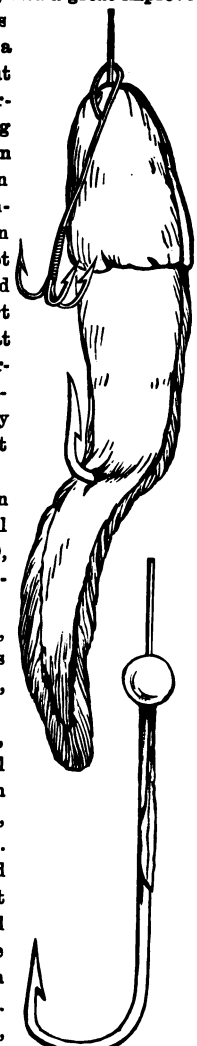

Fig. 35. Eel Tail Bait.

Another amazingly good style of tackle, which can hardly be termed an artificial bait, is the eel tail tackle. I have before referred to it at page 200, and it is therefore necessary for me to give an illustration.

If the shot or weight be made large enough, no weight is required on the trace. This bait is exceedingly nice for working on Nottingham tackle, and very destructive.

The following is the method of preparing it, given by the author of the "Modern Practical Angler":—"Take an eel of from 11in. to 14in. in length, and skin it to within four inches of the tail, cutting off the skin and flesh neatly at this point. Then cut off with a sharp pair of scissors the turned over portion of the skin half way down. Next insert the hook in the centre of the flesh at the upper end of the bait, and run it through as one would threddle a worm, until the point is brought out at about an inch and a half from the tail end, curving the bait. Having adjusted the bait neatly with the fingers, turn the loose skin up again, and with strong waxed silk or fine twine, tie it up tightly above the shot; then turn it down

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again, and stitch the edges down with a needle and strong waxed silk or Holland thread. The bait is then complete."

This bait is said to be best made from an eel that has been salted some two or three weeks. I have, however, made it from a fresh eel repeatedly, and it has answered in a satisfactory style. Its general hue is a pale blue, and pike are very fond of it, especially if it be spun in clear water.

A smaller make, which can also be constructed out of the "sand pride," or small lamprey, is a capital bait for trout. A swivel is best connected to the head of the bait, and a loose triplet hook is slipped over the gimp and on to the bait, as shown in Fig. 35.

The two former of these tackles described can be made in a smaller size for trout, perch, and salmon of course. In such case, and because trout frequently run short, as it is said, it is desirable to slip on a pendant triplet after this pattern(Fig. 36).

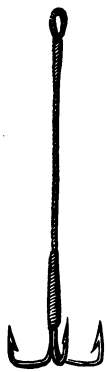

FIG. 36. PENDANT TRIPLET.

This ought to be so placed when making the flight that it extends behind the tail, *not* hooked into the bait.

There has been in times past some discussion as to the sporting morality of the use of a pendant triplet such as that figured in the engraving. It has been said that flying triplets partake of the natue of "foul" hooks, or, in other words, if a fish is captured without having really taken the bait, then is its hook *foul*. This is a rather nice question, and although I suggest the use of a pendant when, as is occasionally the case, the fish are out of shyness running short, I am not sure that I like the use of it under any other circumstances. It is very annoying to find Master Trout continually striking at the bait and missing it by an inch or less, and if such a device ensures a full creel, I am not prepared to deny its legitimacy. It rather seems to me that the score on which an unnecessary multiplication of hooks is to be condemned is rather that of the resultant chance of difficulty in striking them home, *i.e.*, over the barb. As I before pointed out, it is abundantly provable that it is easier to effectually hook a fish with one hook than with many.

With the tackles enumerated the angler may be confident that he has the best that are known. In a work of this nature it would be obviously unnecessary to describe and give illustrations of inferior arrangements. Those given are the *three best* (including the Thames flight, of course) for pike, large trout, and salmon, according to my score years of experience on the best waters of this kingdom.

It must not be thought, however, that they are unassailably best for trout when a minnow is used as bait. Pennell's contrivance, good as it

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is where a decent sized bait is used, is not suitable where a two or one and a half inch minnow is the lure. This author comes to the fore again with a capital contrivance, which, however, possesses an *immovable* lip hook (Fig. 37).

a is the immovable lip-hook, *b* and *c* two triangles, *d* is a lead which is placed inside the minnow. Below is the tackle baited.

The tackle here represented is full size for trout, and may be made on

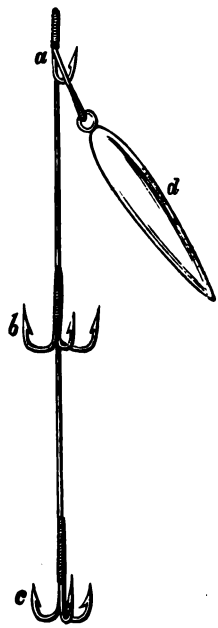

FIG. 37. PENNELL'S MINNOW TACKLE.

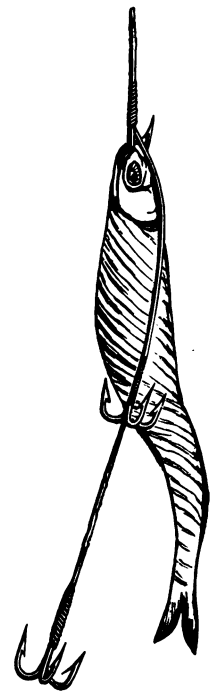

FIG. 38. PENNELL'S MINNOW TACKLE BAITED.

a considerably reduced scale. As will be seen there is a flying triplet to it, and this, owing to the eccentric twist imparted to the bait by means of the *b* triplet is apt to considerably interfere with the spin. This is of no great consequence however, and as the good results of these hanging hooks are generally greater than their disabilities, I, after a good deal of consideration, advise its retention as shown, instead of the slipping on to the muzzle of the bait a loose triplet like Fig. 36.

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This tackle is greatly superior to the Hawker or Salter's arrangement, in that it does away with the unsightly nose cap used in those makes. It also enables the bait to last longer—a matter of some importance if one be short of minnows and the fish running well.

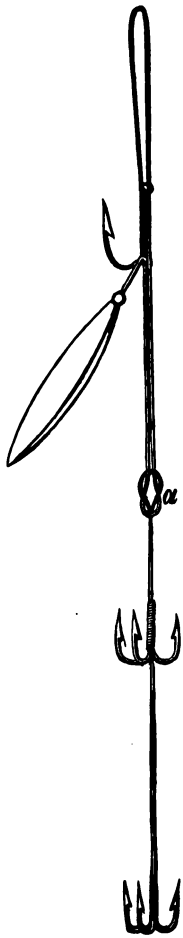

FIG. 39. IMPROVED MINNOW FLIGHT.

Now, though the tackle gives a capital result, its great fault is the *immovable* lip hook. Every time a different sized bait is desired a different sized flight must be used. This is how I obviate the evil—with the "dodge" I referred to a little time since. As the device readily explains itself to anyone who has read what I have said before on lip hooks, I need only say that the hook can be altered as desired by simply loosening the tie at *a* (Fig. 39), and then, when the lip hook is adjusted according to the size of the fish, drawing it tight. Of course, there is, again, just the objection of the double gut above the fish; but in this case it is not nearly so worthy attention as in the case before referred to.

Suppose the angler furnished with the above make of tackle, he selects his bait, and, loosening the tie at *a*, brings down the lead and lip hook till the distance between the lip hook and the first triplet is sufficient to allow of the bait being bent, as shown in Fig. 38. All he has to do now, in order to secure the lip hook, is to draw the knot (*a*) tight. He then slips the lead into the bait's mouth, closes its mouth securely by means of the lip hook through both jaws, inserts the first triangle in the bait's back under the root of the dorsal fin, and the affair is ready for use. There is a loop of double gut to which the trace is attached, and this loop is the only detraction from the perfection of the arrangement—if, indeed, it be a detraction at all.

I make my trout flights after this pattern even for the Thames, and I have never had a mishap; that is, I have never failed to secure my fish on his striking. I find also, if the trace be knotted on, as shown in Fig. 26, p. 410, should a jack by chance take the bait and cut one of the strands of the loop, there is still a chance of securing the fish. This piece of tackle is, I fancy, exactly what is required where baits are varied in size and species.

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My arrangement of lip hook can be adapted to both the patterns shown in Figs. 40 and 41, which, when dressed on fine gut, are good in their way. Of course, as the reader is aware, the method of baiting is to pass the large hook down the throat and out of the tail of the minnow. This bends the tail and produces a spin.

There can be no doubt that both these patterns are very useful in their way, as I before observed, but it is equally certain that when backed against the improved flight, Fig. 39, they lose out of time. Fig. 42 shows Fig. 41 baited, and one can of course see at a glance the extraor-

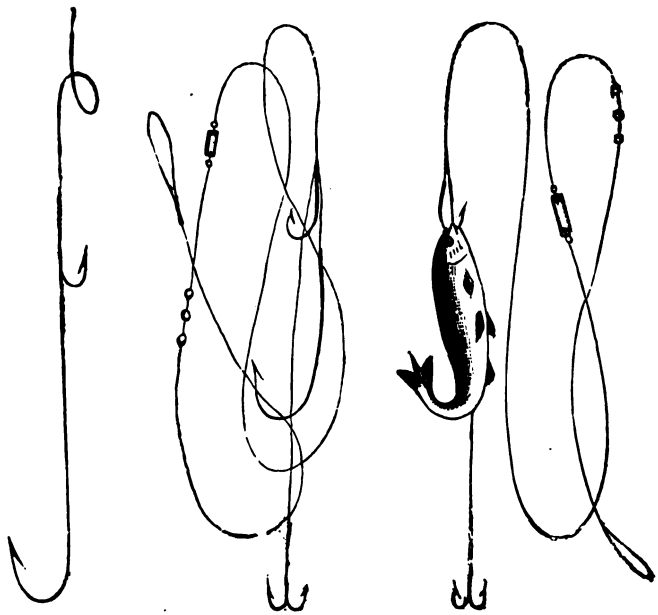

FIG. 40. ORDINARY MINNOW FLIGHT.

FIG. 41. MINNOW FLIGHT AND TRACE.

FIG. 42. MINNOW FLIGHT BAITED.

dinary distortion of the bait as compared with Fig 38. And, moreover, this distortion increases as the minnow becomes soft in the water, which appearance, of course, can by no means be considered conducive to increase of sport.

The chief excellency of the tackle is its ready manufacture. One can sit down by the water side, and with his waxed silk and a few old fly hooks, if no others be handy, rig up a flight in a quarter of an hour after the pattern of either Fig. 40 or Fig. 41. When fishing with it, I

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always give the least appreciable time to enable the trout to turn after taking the bait, and then strike once or even twice sharply.

Mr. Francis invented a very pleasing variation of these tackles some years ago. It consisted of a large single hook, as in Fig. 40, and a lip hook (to which was attached at a distance of half an inch a triplet) made with loops to slip on after the bait had been adjusted on the larger hook. The method of baiting is as follows: take a minnow, gudgeon, dace, &c., and with a baiting needle pass the gut of the large hook from tail to head, as close to the vertebra as possible, and draw the bait down on to the large hook, then neatly adjust it with sufficient crook in it to enable it to spin. Now take the lip hook with its attached triangle, and slide the loops of the former on to the gut, bringing it down to the lips of the bait, while the triplet lies over on its shoulder. Hook both of the hooks into the bait. Then take a piece of waxed silk and tie the lip hook in its place tightly by taking a turn or two round its shank. Of course the reader needs not to be told that the evil of this arrangement consists in the necessity of *tying* the lip hook. My arrangement, shown in Fig. 39, would obviate this, however, and render the tackle very efficacious and convenient.

Figs. 43, 44, 45 represent a pattern of trout flights which has been advocated by a writer signing himself "Walton H," in the angling departments of the sporting papers, and as I personally know that this gentleman has made a speciality of minnow spinning, I cannot do better than allow him to describe them. He says:

"Fig. 40 is made by lapping back to back two pairs of hooks and one single for the lip hook, or double brazed hooks may be used.

"Fig. 43 is made by lapping two pairs of triple brazed hooks and one single for lip hook.

"Fig. 44 is made by lapping one large round bend hook for tail hook, and a small one for lip hook. All the hooks must be bright and lapped with white or light coloured silk and varnished with a light coloured varnish [bleached shellac dissolved in methylated spirits would do, I should think]. This is most important, as dark hooks and lapping offer a violent contrast to a bright minnow, and therefore makes a conspicuous and suspicious object in the water. . . . In baiting Figs. 40 and 41 the single hook is first inserted through both lips of the minnow, either from under to upper lip or *vice versâ*, one of the middle hooks is then inserted in the body of the minnow near the back, and one of the bottom hooks near the tail, taking care to give the tail a curl so as to ensure a good spin—in fact, all that is required in baiting is to obtain a brilliant spin. If a very small minnow is used, one of the first pair or one of the first treble hooks is used to curl the tail, the other double or treble hooks

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reaching behind the tail, and being there still very effective. Fig. 42 is baited by inserting the large hook in the mouth of the minnow and bringing it out near the tail, and then closing the lips with the small hook. The tackles may be made larger or smaller by using different sized hooks, and by lapping them further apart or nearer together; but the patterns I have given are about right in size or small minnows, and

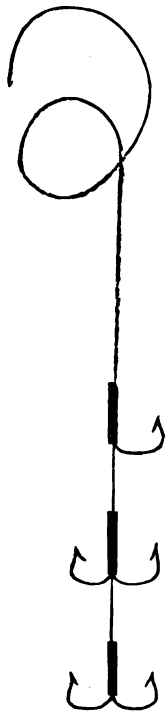

FIG. 43. THE "WALTON H." TACKLE.

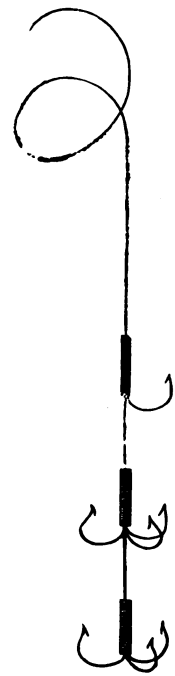

FIG. 44. ANOTHER PATTERN.

FIG. 45. THE STEWART TACKLE.

my experience tells me that the smaller the minnow that can be got to spin properly the better the chance of sport—in fact, if a small minnow does not spin quite so well, it will be taken in preference to a larger one.

"Of the three tackle I prefer Fig. 43, as it does not make so much show in the water as Fig. 44, and is much more certain in hooking your fish

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from the fact of the hooks standing out at right angles to the bait, instead of lying partly on one side, as is the case with the triplet hooks." Fig. 45 is the same as Stewart's pattern.

Thus "Walton H.," and I have no doubt that the tackle he calls the "Walton H." (Fig. 43), is a genuinely effective piece of apparatus if dressed as suggested. "Walton H." must not, however, suppose he is the inventor, for, if I mistake not, Sir Humphrey Davy's "Salmonia" contains a cut of its prototype; certainly Jesse's "Angler's Rambles" does so.

The foregoing remarks, as well as those that follow, it may here be said, are supplementary, and in some instances corrective of the section on Minnow Spinning, which commences on page 263. As this work has been written in small sections and produced at various times, the writer has had opportunities, ere its conclusion, to verify, and in some cases modify, the opinions expressed in earlier chapters.

Reference is made on p. 266 to the *fan* tail. The passage begins as follows: "The tackle used for fan tail is of the same character," &c. By an unobserved printer's error, the paragraph is so much nonsense. The word "fan" there employed should be "par," or "parr," a fish, it will be seen, which is treated upon at p. 173, as being simply a young salmon. A mis-statement, I find, has also crept into the passage referred to. The parr tackle is not identical in principle with Stewart's, as will be seen by what follows. The directions for making the tackle for spinning a par tail are thus given in "Facts and Useful Hints relating to Fishing and Shooting," published at the *Field* office, 346, Strand. Take a piece of stout sheet brass or German silver and make it of the shape of A (Fig. 46), barbing the sides of the centre piece with a fine chisel; turn one wing up and the other down as B; put on the flight of hooks as shown in C; then take a parr's tail, cut as in D, cutting off the fins and tail as shown by the dotted lines; if a minnow is used make a cut down through the gills as at E. Put the pointed barb in at the cut in the parr or at the mouth of the minnow, and push it down towards the tail, covering all but the two wings. Then make the bait fast by sewing it on, passing the thread through the holes *A*, *B*, crossing them as shown in F. Then take the flight of hooks, lay one down on one side of the bait and the other on the other; pass a thread through the tail over the centre fin and shank of the opposite hook, return it and tie it; this keeps all close and secured. Were the flight of hooks left loose, they would fly out and prevent the bait spinning. The two double hooks at the heads of C and F are left loose, and stand out in spinning as there shown.

I find on referring to what has been written on the Brown Trout that

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I omitted to mention the best times and seasons for trout fishing with the minnow. Having given all I can spare space for on the various natural bait tackles, I conceive I may here appropriately supply the

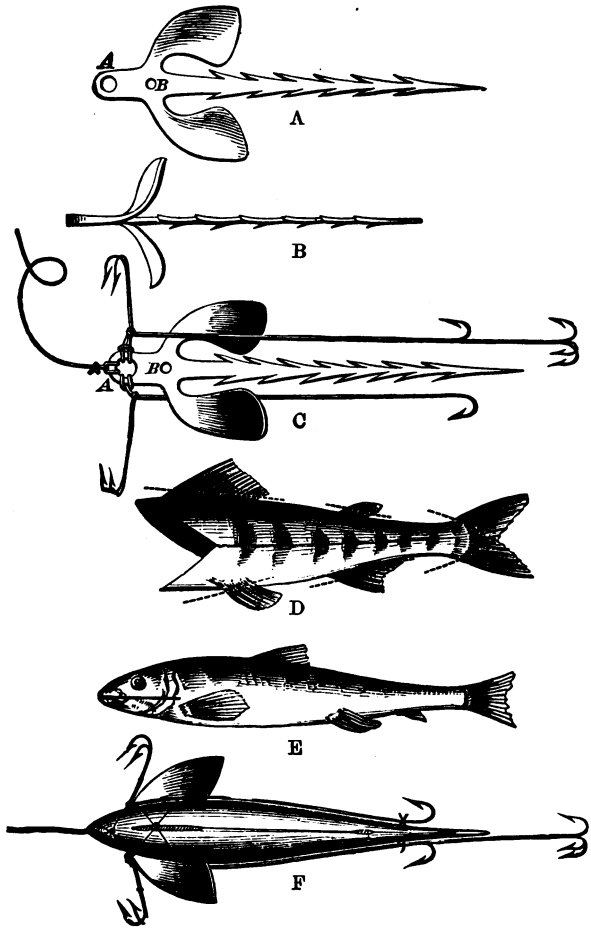

FIG. 46. ARRANGEMENT FOR SPINNING THE PAR TAIL.

deficiency of which I speak. Briefly then, I have found that the best sport is got in clear water, or when it is beginning to clear after a freshet.

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In flood time, just as the stream is beginning to rise, is also favourable, and when it is quite thick then no kind of fishing equals the worm, for dead lines, of course. It is not unusual during such rising of the water to find the best and largest fish in comparatively shallow parts, and in no case have I found it productive to angle in deep water, which must necessarily be opaque and dark. Stewart dissents from this, saying "sufficient shot should be used when the streams are swollen to keep the minnows well under water, as by doing so it is more *likely to be seen*, and the *light being* less, the character of the lure is not so easily detected." The words I have italicised seem to contradict each other. How in the world can anything be more likely to be seen when the light on which vision depends is proportionately *less?*

Casting up stream, if the water be excessively bright and clean, and sufficiently deep, is a much more elegant method than doing so down stream. I have seen small minnows used on the three-hook worm tackle with some advantage.

I now arrive at a short consideration of artificial baits, whose name is legion. Before doing so, I may say that the tyro may take it as an incontrovertible certainty that no artificial baits are worth company in productive power of sport with a well-arranged natural bait. Inasmuch, however, as there are many spots in which trout and pike exist, as well as salmon, and all three, besides perch, will take an artificial bait, "valuing the giddy pleasure of the eyes," when the natural cannot be had, I here notice the best that have come under my notice and experiment. I wish the reader to quite understand that I am speaking after carefully testing each against the natural bait on various occasions.

Perhaps the old spoon bait (see Fig. 47) deserves the post of honour as a good all-round artificial bait. Various sizes are in use, and they are constructed of various materials, nickel, copper, brass, and tin—some are wholly bright—this is the most attractive for the lordly salmon—others are bronzed, or, more rightly, coppered on the outer side; others are painted red inside, sometimes also containing a weight and an addition in the shape of flanges to enable them to spin with greater celerity. Fish, however, soon get used to a spoon bait, and it therefore is only a recommendable auxiliary to meet an emergency.

The rough drawing of a spoon bait, shown at Fig 47, is the size and shape I have used to the greatest advantage. Its colouring I have varied very greatly, according to the state of the water, &c. I find that salmon, the trout, as well as pike and perch, prefer it lightly bronzed on the outside, and quite bright inside. As indicated, a red tassel is enwrapped round the lower triplet; the faint lines show how this is done. A very good substitute for the finished makes of the tackle shops can be manu-

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factured from an ordinary metal teaspoon; the outer side can be dulled by means of a little sulphate of copper in solution. The hooks are arranged as shown.

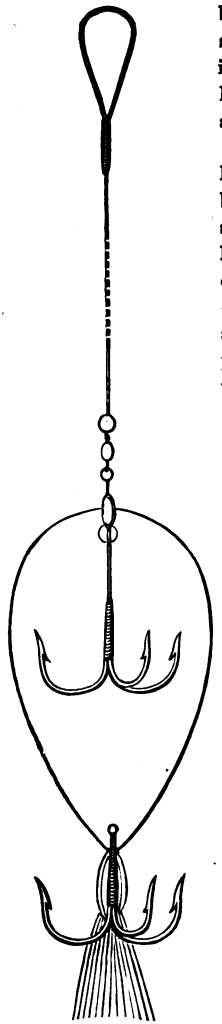

FIG. 47. TASSELLED SPOON BAIT.

Tackle, Fig. 48, has been sent me by Gregory, Vyse-street, Birmingham, which, after careful trial, I am disposed to place in a very respectable position amongst the trout and pike flights. The cut (Fig. 48) shows it. It is a sure captor, and may be used wherever the fish run short with great advantage.

FIG. 48. FLANGED FLIGHT.

As will be seen, a lead of elongated shape terminating in a wire hook of hardened brass is connected directly with the flanges, and a single hook, which is generally passed through the upper part of the shoulder of the bait usually hangs to the left. Following is the method of baiting. Take a minnow or other fish of suitable size—the tackle is made in all sizes—and push the lead and wire hook first down into the

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stomach of the bait, until the flanges stand out right and left of the bait's mouth. The rank hook at the end of the lead of course retains the flanges and lead, assisted by the small hook at the top before spoken of, in their proper place. The triplets are disposed conveniently around the bait, and the affair is ready for fishing. I have included this piece of tackle amongst the artificial baits, because it possesses more of an artificial character than do the other devices spoken of in the past few pages. The only objection to it is the lead being in the bait's stomach — if objection it may be called. I have sometimes found, as in the present case, that this weight is somewhat too large, and that it occasionally impedes the free and true spin which is usually so essential in spinning baits of whatever kind. However, it is capitally adapted for throwing from the reel.

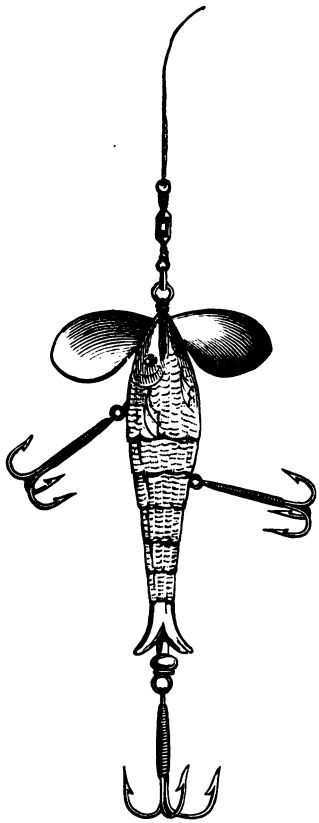

FIG. 49. CLEOPATRA BAIT.

A bait which has attracted considerable attention is Gregory's "Cleopatra Bait." It is made of either nickel plated or golden coloured material, and consists of segments riveted loosely, so that the bait whilst spinning has a livelier movement than an entirely stiff arrangement. The specimen I have tried was fairly successful, and it is well and carefully "hooked."

The peculiarity of the design of this bait was taken, I am told, from that of the tiny jointed fishes in gold, sometimes worn in years past by ladies as pendants and brooches. Whether the title was out of compliment to the famous monolith, about which so much talk was at the time of the bait's appearance being made, I have not had an opportunity of asking Mr. Gregory, or whether the fascinating Queen of Egypt received apotheosis in this destructive lure your deponent

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knoweth not. Anyhow, it is a novelty, and as such, recommends itself alike to fisher and fish.

The "Wheeldon" spinner (registered) consists of a hollow piece of silver plated metal shaped like one half of a small fish. In this hollow is placed the sinker, painted red. Flanges or fins of a rather large size are fixed, as usual, at the head part of the bait, which has its hooks well arranged.

In a recent tour from Teddington to Oxford and back, I tried this bait repeatedly with remarkably satisfactory results. I found it to be an unfailing spinner, and that the fiery flashing of the silver and red was very attractive apparently to both pike and perch. The following is an excerpt from my diary for four days on the Thames, from Sunbury to Surley Hall: First day, four jack, weight, 10½lb.; second day, three jack, two perch—two of the jack were under size, the other weighed 5lb., the two perch, weight, 2½lb. the two; third day, six jack—two under size, four weighing 10lb., and four perch giving 3¾lb.; fourth day, seven jack—three under size, four giving 11lb. 14oz., one perch ¼lb. These were all taken with the Wheeldon bait, and I cannot refuse, therefore, this tribute to an idea which is novel to the fish, and capitally worked out by the maker.

If the former bait is good for pike, as an artificial one, the following is better, for it is the very best artificial bait for pike I know of—Fig. 50 shows it. It is termed by the maker (Gregory) the "Clipper," and really, in the most expressive sense of the word, it is a "clipper." It is usually made of bright nickel or plated silver, with dashes of red between the sides near the tail, and a red worsted tassel intermingled with silver tinsel completes the *tout ensemble*. There is a twist in its structure near the tail that, without distorting the appearance, greatly adds

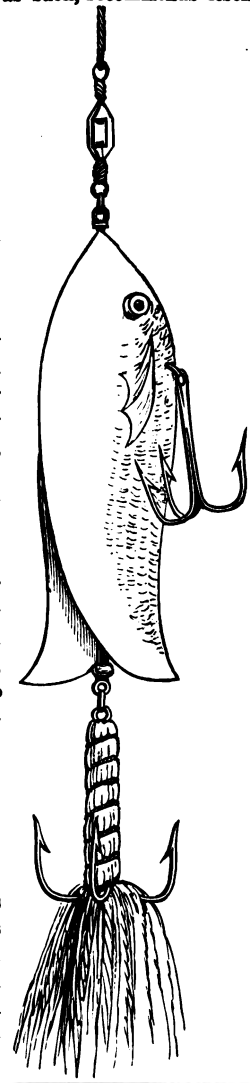

FIG. 50. CLIPPER PIKE BAIT.

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to its spinning celerity. Like all other artificial baits, it of course loses its attractiveness in waters much fished with it and of circumscribed area. I have, however, had great sport with it on some of the best pike lakes in the kingdom, and its hooking power is second to none, owing to the latter hook being of good make and penetration, and to the position of both this and the shoulder hook being exactly in the desired position.

Another hollow bait is produced by Gregory, which is, at least, exceedingly novel. It consists of a hollow silver plated coil, in which a bait is placed, and fixed by a pin held in its place at the tail, after the style of a common safety pin. Thus one side of the bait is in armour. Two flanges are as usual placed at the head of the bait. I cannot say much in favour of it. It looks to me like trying to improve the natural bait, which is a proceeding directly opposed to the conclusions of my experience.

This bait, it may, however, be added, is useful when the natural bait is scarce. It sometimes happens that one has only a few, and those small, left, and in such a case the use of the artificial arrangement in question is undeniably commendable if we turn my objection round, and instead of saying this tackle is an effort to improve on nature, we accept the converse, and admit that the natural bait improves the artificial. This can only be when such a contingency as that mentioned occurs, but as the enclosed bait is preserved a much longer time when fixed, it is justifiable to thus negatively accord praise to the device.

The Colorado bait (a tasselled spoon, to which are affixed the sinker and wings, fins, or flanges) and the Devon minnow (a well known metal minnow) are before me, and I can recall sport with each. These and the hundred and one quill, phantom, bone, gutta percha, tin, and other artificial baits are all and each good in their way. I think, however, those I have mentioned are at the head of the whole lot.

I recollect once extemporaneously making up an artificial bait which, albeit, though rough, if properly and expertly made, is a splendid substitute for the metal manufactures I have detailed. It is made of gutta percha, and this is how: Take a sheet of gutta percha, such as is used by electricians, about a quarter of an inch in thickness—or better still, take a sheet of vulcanite and cut a strip about five inches long, and at the broadest part half an inch. Bring both ends to an apex gradually from the broadest part and drill three holes, one at the top, one on one side at the middle, and the other at the bottom. Soften the vulcanite, by dipping in hot water and taking the top and bottom between thumb and finger of each hand, give it one half twist; let it cool. Next get some gold size, and with a camel hair brush apply it to the bait. When this is

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sufficiently sticky, *i.e.*, nearly dry, gold leaf may be applied to one side and bronze dust to the other. The result is a most attractive looking pike bait. Of course hooks, as in the case of the foregoing artificial baits, must be attached to the body, head, and tail, and also a swivel at the top, and a length of gimp. By experimenting with a gutta percha bait first, as to the exact twist of the bait necessary for a correct spin, some disappointment may be avoided with the vulcanite, the former material being much more tractable, though it does not hold its shape so long, and, consequently, is by no means so satisfactory as the latter.

The proprietor of the *Fishing Gazette* has registered a spinner which exhibits considerable ingenuity. It is intended to be lined with a set of hooks, on which the fish is simply impaled, not bent or placed in any way to cause a spinning motion. This movement the spinner is designed to accomplish. Its shape is based on that of a steamer screw, and the size is from half to two inches in diameter. There are four flanges, and its general appearance reminds me of an old-fashioned ventilator, which one sees spinning round in old houses, turned by the wind. In practice it spins the bait perfectly, and as it is put on the trace about five inches from the bait, the pursuing fish would not be likely to be greatly deterred. My only fear about the arrangement is that a fish rising from the bottom upwards might notice when it passed between the sun and himself.

Since writing the above paragraph, I have had my fears as to the obtrusiveness of this spinner more than once realised. If the reader will endeavour to understand the position of a fish pursuing the bait, he will see that if any part of the attached tackle should by accident pass between himself and the sun, the shadow it throws will be instantly seen. The designer urges that it cannot be seen because its rapid revolutions render it invisible. This I admit is so, so far as the angler looking down at right angles to its course is concerned. But suppose a fish even in an oblique line with its course, surely it would notice two inches of round opaque metal! Anyhow, the following incident occurred to me at Staines some time back: My friend was fishing from above down stream; I was standing some distance from him looking up. Presently I saw the unmistakable figure of a pike rise to his bait, follow it as it slowly passed through the water—for the "spinner" does not admit of rapid drawing in a quick stream. The fish actually made a dart *at the spinner*, and was by the merest chance taken on the lip hook of the bait below. *Ergo*, the fish must have seen it; *ergo*, it is certainly not advisable to use an artificial arrangement of the pattern of the *Fishing Gazette* spinner. However, sport has been obtained by its agency, and I

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do not wish for a moment to dogmatically pronounce it a *bad* device. Ingenious it most unquestionably is, and it is sold by Gregory and others.

With the tackles I have mentioned in his box, the angler need not fear that he is insufficiently provided in respect of hook flights, at any rate, and let me, in conclusion, say a word or two about the preservation and keeping of these flights and baits. First dry them with religious particularity at night time after returning from a day's fishing, rub a little boiled oil over the steel parts to prevent rust, and especially do this to the swivels if they are of steel. A good sort of flight and artificial bait box is sold by most of the tackle makers at more or less extravagant prices. My tackle boxes consist of shallow cigar cases with a piece of solid cork at either end, one for the tail hook, and the other is split for the reception of, say, half-a-dozen ends of the gimp. In every case try your gimp before using. This will often prevent disappointment, which is proportionate to the supposed size of the lost fish.

The next consideration is the *trace* for spinning. Its material is of gut or gimp. Good-sized sound round gut should be selected if that material be used, and I confess that, except when fishing for the larger pike, I always prefer it to gimp, it being less visible. In either case its length ought to be quite three feet. If made of gut it can be tied as before recommended, and ought always to be well soaked before using. If of gimp, its joins ought all to be whipped as directed for the whipping of hooks.

In the chapter on Gut some general observations were made which may admit of amplification here. It should in all cases, whether for the manufacture of trout, salmon, or pike traces, be selected so as to taper towards the end nearer the hooks. This is not of great importance for pike, in fact I invariably use gimp for large fish as being calculated to sustain a greater and more sudden strain than gut, unless this be twisted. Gee, of Great St. Andrew's-street, St. Martin's-lane, has manufactured me some capital twisted gut traces with brass swivels for large pike, and I find them answer admirably. They are, of course, more expensive than gimp, but last longer.

FIG. 51. DOUBLE BRASS SWIVEL.

The swivels which I consider most suitable are those made double and of brass (steel rusts), painted with the green varnish (Fig. 51).

They ought to be fixed—three of them, at equal intervals—one at each

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end and one in the middle. The woodcut exhibits one of the ends. No stationary lead is necessary on my trace.

The reason why I prefer them double is because I have ever found that no matter how cautious one may be in selecting a running line of sufficient weight and kink-resisting texture, sooner or later one of the single swivels gets blocked. I admit the rarity of this with the brass make, but by doubling the number the chance of such an intolerable nuisance as a kink becomes very, very small, or *nil*. There is a little increase in the expense of the trace, but that is compensated for by its superiority in the direction indicated.

The *weight, lead,* or *sinker* I use is after my own design, and movable. Before describing it I will advert shortly to the general subject of sinkers. All other sinkers but my own are immovable after having once been placed on the trace, without, of course, taking the trace to pieces. Now it is often necessary to spin deeper or shallower as the depth of the water requires, without either increasing or decreasing the speed of the bait through the water. This it is impossible to do without altering the position of the sinker, and this in turn, as we have seen, it is impossible to do without taking the trace to pieces—that is, under the old *régime*.

Another evil—which was certainly done away with by Mr. Francis in the *Field* lead, the original make of which is figured below (Fig. 52), was

FIG. 52. "FIELD" LEAD.

the tendency of a sinker of the ordinary round pattern to roll round as did the line and the bait, and so cause a kink. By so constructing the lead, however, that the greater part of its weight hung below the line, it was found that to a great extent the evil complained of was destroyed. Still, even with the greatly improved *Field* lead shown in the engraving (Fig. 52), the same evil, of which I primarily take notice, namely, fixity on the line, remained in even greater force. It is true that one of the tackle makers made the lead with two loops to be moved when a lighter weight was desired. It is also true that the *Fishing Gazette* lead professes to accomplish exactly what my device effects. But this requires that the line be twisted round a wire with which it is armed, and this is by no means a convenient device, because gimp and gut are by no means so tractable as silk, and besides, the appearance of the lead when fixed is awkward.

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Now even Mr. Pennell's lead, although it obviated some difficulties (as shown below, Fig. 53) did not obviate that to which I have alluded. As will be seen by a reference to the drawing, it is a fixture, and so is the ugly contrivance, which, he says, is the latest result of his experiments, here shown (Fig. 54).

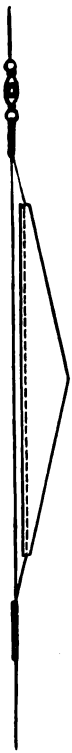
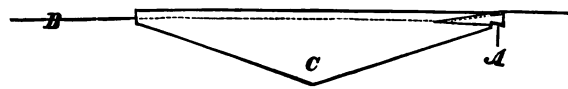


FIG. 53. PENNELL LEAD.

No matter how advantageous the altered form may be, the great deteriorating quality is the necessity of these leads remaining in a stated position, unless, indeed, the angler solve the difficulty by the summary use of the knife.

Suppose oneself to be fishing a stream abounding with pike, but of a depth greatly variable. He has been using a lead, I will assume, capable of sinking his bait two feet, he all the while spinning at a reasonable pace. Now, if he, finding some deeper water, desires to spin deeper, one of two things must be done: he must either take off the trace, because of the lead, or he must spin much slower. If he can, however, vary his lead and its place with regard to the bait at will, his position is one of much greater convenience. Besides, sometimes—if trout spinning, for example—it is desirable to use the lead nearer, or farther from the bait, according to the colour of the water. I pondered on this many a time, and at last I tried to contrive something to do away with this fixity, and the following was my first improvement (Fig. 55).

FIG. 54. LATER PENNELL LEAD.



A—Vulcanite Plug. B—Line. C—Lead.

FIG. 55. KERNE'S MOVABLE LEAD.

The plug was for ever being lost, however, and the lead could not be taken off for the substitution of a lighter one, though it could be moved up and down the line. I therefore again tried, and the cut on opposite page (Fig. 56) is the result:

a is the line; *b*, *b*, are two pieces of fine brass piping sawn through one side to admit the line. Inside these a small tight-fitting plug, the entire length and size of—or a little larger than—the tube, is placed. The line

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is entered at *d*, *d*, and drawn to the top of the tube, and the lead is adjusted, nor will it slip or wear out the line, be it gimp or gut. This weight is made and sold by Mr. Gregory, Vyse-street, Birmingham. I, and several capable anglers, have tried it continually; it gives no trouble, and may be changed in an instant to any position on the trace. It never causes kinking—in fact, a trace made as I direct would never kink, even if an ordinary round lead were used instead of a pendant one. Finally, it does not readily catch in the weeds.

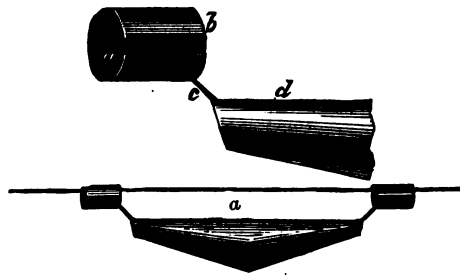

FIG. 56. IMPROVED LEAD.

Now, I readily admit this is not quite perfect, but its principle is sound. The brass tubing may be made much smaller and neater. I invite all who may see this to make a trial of the pattern.

I am endeavouring to get this lead made in small sizes for bottom fishing. Shot is highly objectionable under certain circumstances, and I am convinced that small lead sinkers of this make would be a boon to the barbel and bream angler *et hoc genus*. Oftentimes when a fish breaks your line the accident is traceable to a shot which has been forcibly—unduly so—closed on the delicate "drawn" gut. Besides, one line would serve for heavy or light floats, as occasion required, without it being necessary to change the bottom at each change of scene and place.

The rod for spinning may be either of Nottingham make or an East India cane—the latter for preference. In each case its weight and length should be apportioned to the sort of fishing for which it is required. The reel or winch may be also according to fancy. Personally I like the Nottingham style.

Thus endeth spinning.

I have gone to some length in regard to the history of trolling in the Pike chapter, and I must give it therefore the consideration it here deserves.

Trolling hooks, until Pennell reformed their make, were always armed with a long shank of wire, and the lead was brought down the body of the hook so near its bend that when a bait was fixed its throat was as swollen as if it were in an apoplectic fit. Many a fish, from the fact of its

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feeling the wire and lead, would leave the bait. I have experienced this a hundred times, in point of fact.

If the reader turns back to what I said in the chapter on Pike concerning the teeth of that fish, he will find that this assigned cause of the creature leaving the bait after taking it is an extremely likely one. Yet a great majority of the gorge hooks sold now are made on the supposition that the lead in the throat of the bait, and the wire shank of hardened brass, and therefore inflexible, which often shows itself beyond the end of the tail, are necessary to a good hook.

Fig. 57. Pennell's Gorge Hook.

Mr. Pennell's hook here shown (Fig. 57), however, did away with this, and as flexibility was required he sought, by reducing the size and shape of the lead, to get this in perfection. This he has not, however, accomplished, for the *lead itself* is not flexible, and therefore the fish very often finds this out with his long canine teeth. Moreover, every different sized bait required a change of hook, gimp, &c. Let me put an extreme case. Suppose there were a dozen different sized baits: to give each of them the most perfect chance of taking a fish, a dozen different sized hooks ought to be in readiness, or at least carried with the angler. My design obviates this. It is made, as is imperfectly shown in the engraving (Fig. 59) on opposite page, by different sized leads linked together by an easy slip link, so that, according to the size of the bait, they may be increased in number and size, or decreased. The hook is also made in this fashion (Fig. 58), or *all in one piece*, and as the angler carries in his hook box various sizes, so he can slip on a different one at once.

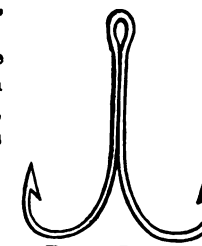

Fig. 58. Brazed Gorge Hook.

Before saying anything further, I must make an observation about the annexed cut. The hook should not be closed and brazed in the shank, but be slightly separated all round, like that in Fig. 59 opposite. It then slips easily into and out of the ring placed at the end of the first lead.

Now, here are the advantages of my pattern. Suppose, as is some times the case, there are a dozen different sized baits in your bait can If it is found that the gorge hook is too long for the bait you wish to

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change to, all that has to be done is to slip off one of the linked leads and substitute another of less length or weight, or, in fact, do without it entirely. Again, it is possible that the double hook does not quite satisfactorily fit the head of the bait; of course, similarly in such case, all that is necessary to do is to replace the hook with another of more suitable size. The other advantage of the arrangement is that it is flexible without conducing to the deterioration of the bait. I do not believe in heavy weights, and therefore would not use a gorge hook quite so large even as the one before us, but in any case it accommodates itself to the pike's mouth much more readily than the "Pennell" does, and having tested it against that make I assert, unhesitatingly, that it is vastly superior. It is now sold by Gregory, of Vyse-street, Birmingham, though some specimens were made by Alfred, of Moorgate-street, and may have possibly been seen there by some of my readers.

FIG. 59. IMPROVED GORGE HOOK.

The most approved fashion of keeping the bait in its place is that which I have used for sixteen years, and which is certainly not of Pennell's

FIG. 60. TIE FOR GORGE BAIT.

sole invention, though he takes so much credit to himself for it. The annexed figure (Fig. 60) shows it.

The following (Fig. 61) shows it *in* the tail of the bait. After bringing the line out at the tail, the baiting needle is thrust through the vertebra of the fish, and then brought round and through the loop made and drawn tight, and the fish is as secure as it is possible to make it.

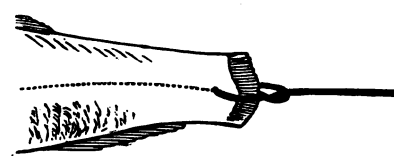

FIG. 61. TIE *in situ*.

There is a smaller gorge hook which can be made for trout and perch. It consists of only a single hook armed with lead and a minnow for bait. About half a minute is given in which for the fish to pouch.

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I have long tried to invent a gorge hook which would still "shoot headlong through the blue abyss," and yet not require the wearisome ten minutes for pouching, but with little or no result. I think there has been a sort of snap, which, when once struck, opened out into two prongs —not hooks; but I forget the details of its manufacture, which would certainly not be the case if I had seen any excellence in it.

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CHAPTER XI.

TACKLE FOR LIVE BAITING.

FIRST, as to live baiting for pike. That style which most nearly approximates to gorge fishing, but which, in my opinion, is not to be compared to it, as a means of real sport, termed "live gorge baiting," consists of a double hook, tied on gimp of the annexed (Fig. 62), or an analagous pattern.

FIG. 62. DOUBLE BRAZED HOOK.

The loop of the gimp to which such a hook as this is tied is placed in the loop of the baiting needle, and the point of the latter is entered just under the skin of the dace, about a quarter of an inch nearer the tail than the termination of the gill cover in the same line. It is brought out nearer the dorsal fin than the lateral line, about half an inch from point of insertion. The hook is then drawn tight in the wound, and of course the hook, in such case, lies almost on the fish. About ten minutes is allowed for a medium sized dace to be pouched.

A baiting needle being required for both this process and that of baiting the gorge bait proper, I think this is an opportune moment for giving an illustration of the best sort I know (Fig. 63). It ought to be made of brass, not steel, as the latter is so liable to corrode, and brass is not.

Now I utterly and entirely object to the cruelty and general unsportsmanlike style of this live gorge fishing. I am not going to say I have never fished in this way, but I have seen the error of my youth, and, for one, I will never again, unless under very extreme circumstances, fish with a bait tortured as described.

There can be no doubt that exquisite pain is suffered by a dace

FIG. 63. BAITING NEEDLE.

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whose skin has been perforated in this manner, and more especially when the wound lets in the oxygen of the air. In water the pain may not be nearly so great, and that is one reason why a fish does not suffer as has been supposed by being hooked; but the convulsive thrills that run through the struggling fish as it is being impaled are to me so piteous as to induce me to chronicle a resolve which I trust will be adopted by my brother anglers. Let it be understood that I say nothing about passing the hook through a fish's cartilaginous lip; but between this and an unmerciful tearing and oxygenising of a skin wound is a very great difference.

A method of *snap* fishing, recommended by Pennell, here requires some remarks. The following illustration (Fig. 64) shows it.

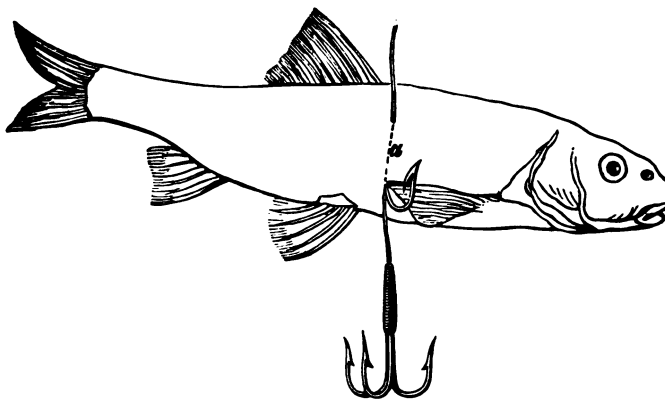

FIG. 64. PENNELL'S LIVE BAIT SNAP.

Now this is a remarkably deadly method; but can anything be more like unnecessary vivisection than the under-skin attachment here shown?

Of course the skin at *a* is by no means very thick, and supposing the angler, by some mishap, entangles his line as he hurls the bait out for a long throw, what is the result? "So much the worse for the bait," you reply; and indeed you are right, for the poor brute is jerked off, perhaps to live, but more likely to die a death which must, in the very nature of things, be more painful than any other.

It is not figured because of its merit, but because, as Pennell is one of our chief pike authorities, anything he puts forward requires the fullest treatment, either to overturn or criticise. I do not like his method, if only for the reason that the hook (*a*) tears out very soon, and

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thus causes great inconvenience. (It will be seen I am leaving out the question of pain for the moment.) Another method, and the ordinary one in use at the present day, is to pass the hook (*a*) under the root of the dorsal fin. This is superior from an angling point of view, because no baiting needle is necessary, an item of importance on a cold day. Another style is in the hooking of the fish through the lip, and the placing a triplet so that one of its hooks are fastened through the root of the back fin. Each one of these methods causes the fish unnecessary pain, unnecessary because as good a result can be secured by another means at much less a cost of pain to the bait. One of these is as follows (Fig. 65). A is an india rubber band, which can be passed over the ventral fins, and to the side of the dorsal, thus retaining the triangle hook in its place between the two. A lip hook is passed through the upper and lower lips, and the affair is complete. The pain that is caused is only when the hook is passed through the lip, and this is, compared with that of the threadling process, infinitesimal. The whipping of the india rubber band to the shank of the triplet is not shown in the cut, but it should be whipped securely, and of course when baiting the head of the bait is slipped through the band in the direction of the lip hook until the band rests behind the ventrals as described. The lip hook is then drawn down and fixed through the top lip of the bait, and the trace, to the end of which a piece of pliant line has been whipped—it ties better than gimp — is tied securely in the loop shown in Fig. 65. From the fact of the triplet being rather to the side of an ordinary pike's mouth if one is fishing with a bait suitable to the tackle here shown, there is a really great chance of hitting your fish in his most vulnerable part and at once. Then the vexatious five or ten minutes is obviated, for it is unnecessary to wait as in ordinary gorge fishing.

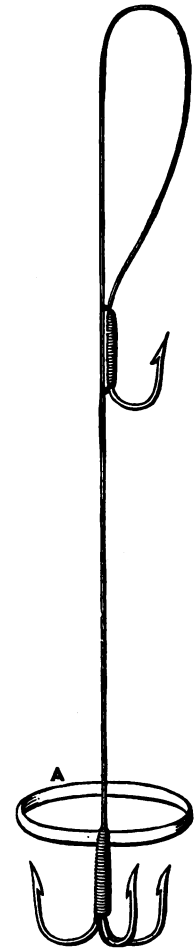

FIG. 65. HUMANE LIVE BAIT SNAP.

The inveterate snap fisher may, however, assert that this tackle impedes the free movements of the bait by hooking it by the nose, and so

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lessens its attraction; and, doubtless, except in very sharp streams, he has good cause for the objection. I, however, have prepared myself for this, and I present an arrangement which altogether does away with pain to the bait, unless, of course, a rather light waistband can be looked upon as the cause of excruciating pain.

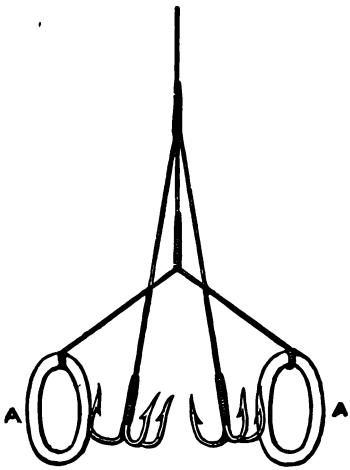

Fig. 66. Improved Snap Tackle.

A, A (Fig. 66) are the *two* india rubber bands, that are passed one round under the pectoral, and the other the tail side of the ventral and the head side of the dorsal fins. They must be made tight enough, the pressure causes the bait no inconvenience, and it does not escape, at least I never found one to do so. Of course the rings should not be too thick, and the throw should be as careful as possible. The hooks hang down on each side, and the strike should be sharp and instant. Of course live baiting for trout *may* be conducted on similiar principles if one chooses, but I unhesitatingly condemn it as ignoble and unsportsmanlike. The only live baiting allowable is that conducted on the "Nottingham" method, as described in the Trout chapter. This here needs no reference. There is no such thing I trust as live baiting for salmon.

It is just possible that A, A, being of indiarubber, might prove some sort of an obstacle to sport, especially if at all clumsy. I have, therefore thought—though the affair answers capitally as far as my experience goes—that perhaps a couple of ends of silk tied somewhat tightly would be a better form of waistband; of course, it must be carefully looked to that one of them is behind the ventral fins, and the other beyond the larger abdominal swelling—I am supposing we are using, say, a well-conditioned dace—near the gills. Do not, however, tie the ligature quite round the *throat* below the gills, for there lies the heart of the fish, and pressure would certainly affect respiration. One of the faults of such a "tying" arrangement would be its inapplicability in cold weather—just the very time when pike come at you most hungrily.

Only one other way of live baiting need here be noticed, and that is

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"Trimmering." A trimmer, properly so called, is a round piece of cork, round the periphery of which line is coiled, and to this depends the double hook live gorge. A peg is placed in the middle, and the line is fixed in it, so that when a fish takes the bait, the line escapes readily. Fig. 67 exhibits the affair in its entirety.

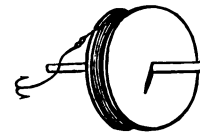

Fig. 67. Trimmer.

One side is usually a different colour to the other, that if so set, as it may be, that when a fish runs the trimmer turns over; this may be readily seen without disturbing the water. Sometimes a line is affixed to bottles or bladders.

Sometimes, also a line is attached to a duck or goose, and old Barker chuckles with much emotion over this eccentric pastime. He terms it the "sport of princes," or some such hyperbole is used, and Taylor, who wrote a book on angling, in which he flattered himself he had reduced the art to a complete science, terms this amusement "fluxing." I know of a much better piece of amusement than that, which once occurred when I was fishing in the upper end of Virginia Water some years ago. We had been live-baiting persistently, and, at last, down went my float. I struck and broke my line; away went the fish into the weeds on the opposite side (it is quite narrow at the spot indicated), and there he tarried. I was just contemplating going round—for I hadn't the boat—and over the bridge some quarter of a mile distant, when the shepherd from the Model Farm put in an appearance, followed by a true old lurcher and a little wiry rough-coated mercurial terrier, famed for miles for her vermin-killing propensities. I said, "I wonder if Juno," that was the bitch's name, "will go out and fetch that float," and, so saying, I pitched out a pebble to within a yard of it. In went the little bitch, and by dint of throwing another pebble or two I got her to understand what was wanted. She had soon seized the float, and then came the tug of war. Juno had been taught in early life to "never leave go," and she was not, at her years, going to do so now. How manfully the little dog struggled I cannot describe in words. At all events, after a quarter of an hour's fighting with the obstinate fish, she brought him and a bushel of rotten weed to shore, and then, exhausted as she was, revenged herself by barking, biting, and snapping at him, as he struggled on the bank. Such an encounter, it will be acknowledged, beats "fluxing" hollow.

Another form is a bifurcated branch, round which line is wound and retained in a slit in one of the forks. Of course it is cut to smoothness, and is as nearly like the latter Y inverted as possible. This is suspended to an overhanging branch, and a live bait attached for pike, or a dead bait

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for eels. It is not sport for the former, but it is an effective method of capture for the latter fish.

Of course it must be understood that I am in no wise a partisan of "Trimmering" as sport, but it is frequently necessary to remove pike from preserved waters, and this is a useful means to employ.

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CHAPTER XII.

FLY MAKING.

In those chapters devoted to the *Salmonidæ*, I gave directions, so far as materials were concerned, only for the manufacture of such flies as I considered worthy the chief place in the tackle basket of the practical fisherman. I also referred, in the chapter on Pike, to the possibility of taking these fish with a nondescript fly, similiar in principle to that used for salmon, although in general appearance more gaudy and of easier arrangement, as befits a fish of much more vulgarity and less value in every way.

As I have just been primarily treating on the capture of this predatory fish, perhaps before adverting to the "fine art" of fly-making for the *Salmonidæ*, I had better give such directions as occur to me for the manufacture of a pike fly. As I before intimated in the chapter on Pike, a degree of *finesse* in the arrangement of this fly, if by such term it may be dignified, is not necessary. In fact briefly it may be averred that the gaudier and more flaunting the production is, the better are results likely to be. An effective pike fly may be made up as fat and rough as the maker's fancy directs. Many light coloured pigs' wool, cock hackles, beads and tinsel of silver and gold may be blended, and the body thus made may be supplemented by wings of the peacock's mooneyed feathers. The whole should be as large as a small canary. Double hooks or a light well tempered triangle, somewhat large sized, may be employed, and the affair is complete.

More than this anent pike flies need not be said, except, perhaps, that they are not very productive, unless in exceptional cases, such as I have previously referred to.

Since writing the observations on the results of the pike fly, on page 160, I have learned to despise a gaudily made pike fly much less. As an artificial bait in summer, when *Esox Lucius* is somnolently enjoy-

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ing the agreeable warmth of the sunbeams, I am disposed to praise it. It makes less splash for one thing than a leaded bait does, and say what we may about the indifference of pike to noise when a nor'-easter is blowing the water into anger, we must not ignore the fact that quietude is necessary on calm late summer and autumn days. Besides this, the fly is a novelty of the first water to fish used only to the common herd of artificialities, and is therefore, when they are not roused to hunger by colder water and exciting winds and frosts, likely to be, and, as I have since proved, indeed is, a lure of a very successful character. Let the angler not disdain a pike fly made as indicated after the gaudiest possible pattern.

Artificial fly making for the *Salmonidæ* next demands my attention, and although, as I have before remarked, there is great difficulty in giving directions for mechanical work, yet I am sanguine that the painstaking tyro will not find it so difficult a matter to make a decent fly as might be supposed. Perfect neatness and finish cannot of course at first be expected, nor can perfect imitation generally of the natural fly be accomplished without great practice. The numerous beautiful shades of the Ephemera are not matched without considerable knowledge and resource of material. Other insects not comprehended in this class are variously fraught with difficulty in their successful imitation. Nevertheless, the accomplished fly maker is able to sit down by the brookside, and with his little bag of feathers and fur and such other articles as I have previously enumerated, manufacture a complete simulacrum of the fly he has just threshed from the sedges or shaken from the overhanging alders.

The materials required for fly making are of infinite variety. The dubbing bag should contain, "everything in the world in the way of furs, mohairs, wools, and silks." Of course this is an extravagant direction, but there is no doubt that the greater the variety of material so also the greater the resources of the angler. The beginner need not aim, however, at getting a vast collection together. A few reliable dyes and a little ingenuity will often produce an attractive imitation of the natural insect of fair sport-producing powers. It must not, however, be imagined that a superlatively successful fly only depends on its colour. Material goes a great way, and if the angler expects a sage old trout to keep a rough harsh fly in his mouth even the eighth part of a second, he is greatly mistaken. The softer the fly and the more it resembles its natural prototype in texture the better. For excellence in this particular the fisherman depends considerably on his dubbing bag.

The feathers used chiefly in constructing the wings of the fly must

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of necessity be selected with great care, and the process of dyeing them in my experience, except in the case of Judson's dyes, has not been attended with remarkable success. I nevertheless give some directions for doing so below. As many of the feathers are valuable, it is eminently necessary that they should be preserved against the inroads of insects and damp. For this purpose, if the angler can afford it, he should provide himself with one of the entomological cabinets which are manufactured moth proof (mine came from Baker's, of 244, High Holborn), and neither moth nor mildew then need be apprehended. When the fly fisher goes "a fishing" he can select a few of the feathers he supposes he may require, and these can be carried in a small russia leather case, in which I find a mite of camphor very useful as a preservative against possible vermin.

The feathers the angler, as a beginner, will find the most useful, are as follows: Hackles from the neck of blue dun hens, especially those with ginger coloured edging; hackles from the neck and near the tails of game cocks, both red and furnace; hackles from the neck of the black Spanish cock; scapula feathers of the woodcock or grouse, and brown mottled feathers from a partridge's back. These, with wings of the starling, landrail, and hen pheasant, and tail feathers of the wren, with some peacock and ostrich herl, may suffice to begin with. Some grey and brown mottled feathers from the wild drake may be added to the collection. These feathers are almost absolutely necessary to even the beginner, and as there is no special difficulty in obtaining them, should all find a place in the list of useful materials.

As I have mentioned dyeing as being an operation of convenience, it may not be out of place here to give one or two of the most reliable and useful recipes. They are taken from Ronald's "Flyfisher's Entomology," not because there is not plenty of equally good formulæ, and possibly some better, but because I have personally tried each of those which follow and found them satisfactory. Of course I am not forgetting Judson's dyes.

1. *To dye white feathers a dun colour.*—Make a mordant by dissolving about a ½oz. of alum in water, and slightly boil the feathers in it, taking care that they shall be thoroughly soaked or saturated with the solution; then boil them in water with fustic shumach, and a small quantity of copperas; put the feathers into it until they have assumed the required tint. The fustic, or copperas, will give a yellow or dun hue. The greater the quantity of copperas the deeper will be the dye.

2. *To turn red hackles brown.*—Put a piece of copperas the size of half a walnut into a pint of water; boil it, and whilst boiling put in

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the red feathers. Let them remain until, by frequent examination, they are found to have taken the proper colour.

3. *To stain feathers an olive, dun, &c.*—Make a very strong infusion of the outside of brown leaves or coating of an onion root, by allowing the ingredients to stand warm by the fire for ten or twelve hours. If dun feathers are boiled in this liquid they will become an olive dun, and white feathers a yellow. If a small piece of copperas be added the latter colour will become a useful muddy yellow, darker or lighter, approaching to a yellow olive dun, according to the quantity of copperas used.

4. *To dye a mallard's feather for the green drake.*—Tie up some of the best feathers in bunches of a dozen, and boil them in the same mordant of alum as given in No. 1, merely to get the grease out. Then boil them in an infusion of fustic to procure a yellow, and subdue the brightness of this colour by adding nitrate of copper.

5. *To dye feathers dark red and purple.*—Hackles of various colours, boiled (without alum) in the infusion of logwood and Brazil wood dust until they are as red as they can be made by this means, may be changed to a deeper red by putting them in a mixture of muriatic acid and tin, and to a purple by a warm solution of potash. As the muriatic acid is not to be saturated with tin, the solution must be much diluted. If it burns your tongue much it will burn the feathers a little.

6. *To dye red hackles a claret colour.*—Boil a piece of Brazil wood in half a pint of water, and simmer some lightish furnace hackles in this for a quarter of an hour. Then take them out and immerse them in muriate of tin, with the addition of a little muriatic acid. Wash and dry.

7. *To dye feathers various shades of red, amber, and brown.*—First boil them in the alum water (see No. 1); secondly, boil them in an infusion of fustic, strong enough to bring them to a bright yellow (about a tablespoonful to a pint of water), then boil them in a dye of mather, peach wood, or brazil wood. To set the colour, put a few drops of "dyer's spirit" (*i.e.*, nitrate of tin, combined with a small quantity of common salt), which may be had from a silk dyer, into the last-mentioned dye.

I have also tried the following, and found them very useful:

Black dye.—Soak the material in a solution of acetate of iron—warm, then boil in a decotion of madder and logwood.

Blue.—Use indigo, varying time of soaking according to shade required.

Crimson.—Dip in acetate of alumina mordant, then in boiling infusion of Brazil wood, then in a bath of cudbear.

Deep red.—Proceed as above, omitting the bath of cudbear.

Yellow.—Acetate of alumina mordant, and bath of tumeric.

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As before stated, I have also found Judson's dyes very good, and as they are very commodious and compact I have no hesitation in recommending them. The only thing to remember is that they are chiefly aniline, and are apt to destroy the fibre if used too strong. The directions contained on each bottle may with advantage be regulated by one's own experience—after this has been bought—but at first the tyro had much better adhere to them.

Perhaps one of the most useful flies to the flyfisher in almost all seasons is what is termed the palmer, and a specimen, of this kind, with the reader's permission, we will construct together. First, however, lest some hypercritical friend should feel disposed to find fault, I had perhaps better remind him that the prototype of our *palmer* is not a fly, but a caterpillar. Thus the "red palmer" is the larvæ of the garden tiger moth, and is presumably so fastidious as to dress that, as Cuvier asserts, it changes its skin ten times during its growth, slightly changing its colour the while. This is, of course, by the way.

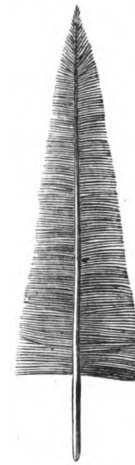

Fig. 68. Hackle Stripped for Tying.

Now for the actual process. Let it be supposed that the tyro has around him his materials necessary to complete the fly. These will be a No. 6 hook of whatever pattern he may select, a length of gut, a length of well waxed silk of about 12in., two fibres of peacock herl, about 4in. or 5in. of gold twist, and the red cock hackle, which may be varied by dyeing it a ruby colour for some rivers. After tying the gut to the hook, as before directed, the hackle should be taken, and the down which is usually found near the quill should be stripped off. The tiny feather may now be drawn between the finger and thumb until it presents the appearance shown in Fig. 68. It should now be taken, holding the hook as in Fig. 11, p. 387, and, together with the herl and gold wire, should be whipped on the end of the hook nearest the bend, as shown in Fig. 69. The top end of the hackle

Fig. 69. Herl and Hackle on Hook.

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and the points of the herls should be nearest the bend. Now take the free end of the tying silk and wind it in wide spirals up the shank of the hook, securing it temporarily by passing it between the gut and hook, as in a niche, or by attaching the pair of spring pliers (readily obtainable at any tackle maker's) before mentioned. The best kind of tweezers are here shown (Fig. 70). This procedure is simply for the purpose of retaining the waxed silk unentangled with the feathers, to which of course it would otherwise readily adhere. Now carefully take the two herls between the right forefinger and thumb, and wind them helically to the end of the shank, release the silk and secure the herls by a couple of turns, retaining the silk as before. Next, in a precisely similar way, wind the gold tinsel in broad coils to the end, release the silk thread again and fasten the tinsel with two turns and a half hitch. The stage at which the fly has now arrived is shown in Fig. 71.

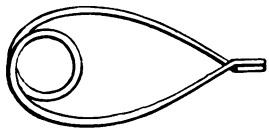

FIG. 70. FLY-MAKER'S TWEEZERS.

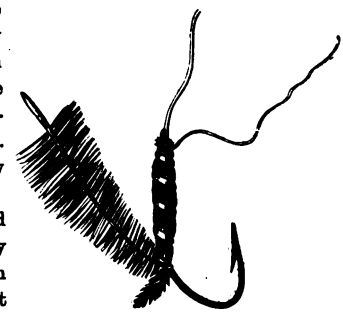

FIG. 71. PALMER NEARLY COMPLETED.

The quill end of the hackle should now be wound slowly and tightly along the shank, as was done with the gold tinsel. This is done best by tying a waxed thread tightly to the quill end, and then winding the hackle, fastening as before with two or three turns of the silk and two half hitches. The loose end of the silk may now be carefully snipped off, and any other inequalities that may mar the symmetry of the fly may be reduced. The production should bear the appearance of Fig. 72, and the fly is done except varnishing. The varnish need only be applied to the head, or part last finished. I always whip the hook securely and varnish it, and *then* attach fur and feather. Thus the whipping is waterproof and lasts longer, I find, than if otherwise made.

FIG. 72.
PALMER COMPLETE.

The fly thus described should be made in a considerable number by the learner before attempting a winged fly. The making of a palmer stands halfway in the progress of the angler towards his

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complete success as a manufacturer. The successful imitation of some of the finer of the ephemera is a perfect work of art to which the simple making of a palmer bears little comparison. Of course, the scale on which the drawings are given is not correct, being too large, and simply so for the sake of rendering the instructions as comprehensible and plain as possible.

Now the directions given are the basis as indicated of all artificial fly-making, and really but little can be here added to them with a view of further instructing the would-be flymaker. I would suggest to any of my readers who desire to acquire the complete art that they visit any manufacturing flymaker's and notice the facility with which the girls tie the most seemingly intricate patterns of artificial flies. The truth that practice alone can render mechanical precision faultless would in such case be abundantly demonstrated to them.

As, however, many will be dissatisfied if I do not furnish the details of the making of a winged fly, I will do so, and for that purpose I select the "great red spinner." These are the directions after Ronald:

Take a piece of fine round gut, and either singe it in the candle at one end or draw that end through the teeth, flattening it the while, in order that it may be held the more tightly when whipped. Then holding a fine length of silk—waxed with either of the waxes before given—the colourless for choice, in one hand, whip a part of it three or four times round the end of the shank of the hook, and leaving a few inches of the thread hanging down with the tweezers attached.

Hold the burnt or nipped end of the gut in contact with the shank of the hook and wind tightly the portion of thread first once or twice round the gut, close to the end of shank, and then over the portion of gut the three or four coils already made, and the shank of the hook, leaving out the piece of thread still hanging down.

Now bring two or three stylish whisks from a red hackle into the position near the bend of the hook, and bind them securely there for the tail by means of the same end of silk as was last used. Bind in at the same time the extremity of a piece of fine gold twist and also one end of some dubbing of orange and red floss silk mixed. Then spin the floss silk on the remnant of thread and wind it on the shank, or wind it on the shank without spinning.

Run the remnant round the shank three parts up it, and make it fast there with the thread, then wind the gold twist over the coils made by the remnant of thread in the manner shown, and make it fast also with the thread. This completes the body.

Bring the butt end of the red hackle, stained amber colour, into posi-

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tion, tie it there by means of the well waxed thread at the end of the shank, and cut off the projecting piece of the hackle.

Wind the other parts of the hackle two or three times round the upper end of the body, and bind it tightly and neatly there. This represents the legs.

Take two pieces from the under covert feather of a starling's wing and bind them on with the butt end, towards the top of the shank, firmly and neatly at nearly the same place (a little nearer to the top of the shank), part them with the pricker, snip off the butt ends obliquely, bind the short stumps down upon the shank (so that they may not be seen), and fasten off. Then is the *great red spinner* made.

To make a salmon fly is a somewhat easier process. The following correctly describes it as well as words can do. Select some hook and gut, and whip on as in a trout fly. Fix on the tail with two turns, and one turn under it; then whip on and twist a hackle, whipping it on at the points. Before putting on the hackle, take the point in the left hand, the stump in the right, the inside of the hackle towards your mouth, then between your lips draw up the fibre of the hackle so that the top fibres sway up and the bottom ones be pulled up towards them. If you use coloured worsted for the body whip twice round the short end, leaving the long end hanging out towards the tail. Then whip the silk back towards the head, then twist the worsted back to the head and fasten off, then the twist, then the hackle, fastening it each off with two turns. If you use fur or dubbing, you must spin on the silk with your fingers, and whip it round the hook with the silk, then fasten a fibre of ostrich or peacock tail for the head, then whip on the wings with three turns, letting the ends of the fibres come under the hook at each side, then form the head by twisting round the tail, and finish off with two half hitches, and varnish. In dressing a large salmon fly the jeweller's table vice will be found useful instead of the fingers.

Willingly would I attempt to detail the manufacture of other flies, but space, even were it likely to be a successful attempt, will not permit. In conclusion of this branch of the subject, I can only say that the tyro must exercise the utmost patience and persevere. This advice I am almost inclined to place first, before all I have said explanatory of fly-making.

The plate given on the opposite page illustrates the natural flies most in use during the trotting season. It is obviously impossible to show the exact tints of each, but the outline is carefully secured. Reference to the flies will be found in the Chapter on "The Common Brown Trout."

Before concluding this chapter I will here advert briefly to some beautiful imitations of the grasshopper, grub, &c., often valuable,

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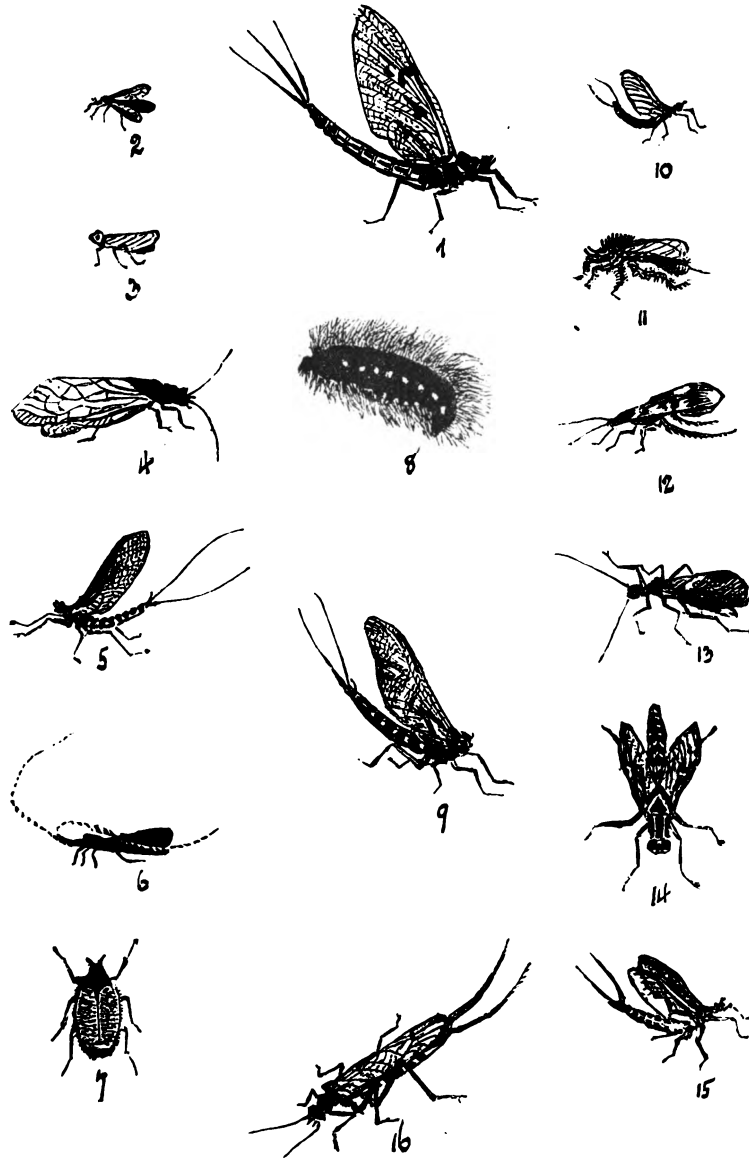

FIG. 73. FLIES IN CONSTANT USE (NATURAL).

1. Green Drake.
2. Black Gnat.
3. Wren Tail.
4. Alder Fly.
5. Yellow Dun.
6. Silver Horns.
7. Marlow Buzz.
8. Red Palmer.
9. March Brown.
10. Iron Blue Dun.
11. Cowdung Fly.
12. Cinnamon Fly.
13. The Red Fly (Old Joan).
14. Oak Fly.
15. The Blue Dun.
16. The Stone Fly.

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which are given by Mr. Hewett Wheatley. I have borrowed the illustrations which accompany them, and as I prefer to quote that writer's own description of his baits to paraphrasing it without due acknowledgment, as several authors have done, I give his explanation *in extenso*.

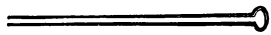

FIG. 74.

"A piece of thin brass wire is doubled, having a small eye for the admission of the gut (Fig. 74). This wire is passed through a piece of lead, varying in length from one to two inches, and so pressed upon the wire as to prevent it from turning round, the wire being left half an inch beyond the lead at the tail end, the lead extending at the other, or head end, close to the loop, formed by doubling the wire (Fig. 75). Now bend the lead into the shape of Fig. 76. A small triple hook having been previously tied to a short piece of thick gut, one end of this stout gut is next passed through the eye of the wire, and the end to which the hook is *not* attached is tied down upon the lead, working the silk from head to tail, leaving the hook so as that, when all shall be finished, it may be near the tail end. The *bend* of the hook may be a little lower, but not the *points*. Take one length of green worsted, not very dark, and one length two shades lighter; tie the ends of these on the wire, close to where the lead terminates, at the tail of the grub. Make one warp with these two lengths of worsted towards the head. Bend over that warp the half inch of wire which extended beyond the tail and press it close to the head. Go on winding the worsted over the lead, taking care not to twist it till you reach the end near the head. Fasten it, and in so doing warp in a strand from the peacock's tail feather, or from the black ostrich. During this operation the hook has been bent *away* from the body, to allow you to wind on the worsted. Press back the gut so that the hook shall lie near the tail of the bait, and secure it in that position by a few turns of the silk. Wind the peacock's or ostrich's tail over these turns four or five times, so as to form a head. Fasten all, and you will have the most killing grub ever introduced into a stream.

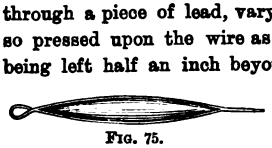

FIG. 75.

FIG. 76.

FIG. 77.

"Fig. 77 is similar to Fig. 76, but made on a large single hook. Put on lead in a mould on the shank of the hook. In binding on the worsted, warp in a piece of tolerably thick netting silk, a rather pale yellow, waxed with white wax, or dark brown silk instead of yellow. Having wound on the body, as directed for Fig. 76, next, with the

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piece of yellow or brown silk (which, while you wound on the body, should have been left hanging down by the bend of the hook) fasten on each side the hook a narrow strip of bright straw, of about half a straw's breadth. Lay it along each side of the body. Holding it in that position, wind on over all the thick yellow or brown silk with which you fastened the straw to the hook, but not too thick; six or seven times, at equal distances, will be sufficient. Attach the peacock's strand for a head, or omit it, and finish. The hook for this should be made with an eye. The wire should be fine, and, what is of great importance, the point should stand well off from the shank."

For another grub, Mr. Wheatley says: Prepare the wire, and in all respects proceed as in the fabrication of Fig. 76; the material for the body and the head being straight making the only difference; save, indeed, that it should be shorter than Fig. 76. The body should be formed of white silk chenille.

Another capital lure is intended to represent the green drake as it issues from its grub state. It is made either on a double-brazed hook, similar to those on which the larger palmers are commonly made, or with a loose triple hook, in the manner of Fig. 76. The hook or wire, as the case may be, is headed. The body is of pale, dirty yellow silk chenille, as fine as can be procured, ribbed with brown silk or a fibre from the common cock pheasant's tail. The wing is the usual mallard's feather stained a greenish yellow, and so put on as to lie close to the body, just the contrary to what it is after it has once risen to the top of the water. Wind on a speckled ginger feather for legs, and it is finished.

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CHAPTER XIII.

TACKLE FOR THE CARP FAMILY, ETC.

THERE is very little left to be said on the class of tackle here referred to. The worm and bait fishing for the *Salmonidæ* is but an adapted style of tackle for that used in the pursuit of the coarse fish. In each case it should, however, be borne in mind that the former is even of a finer and more delicate texture than the latter if sport is expected to be at the maximum.

Whenever any tackle for baits has been of a character adaptable to the *Salmonidæ* the fact has been mentioned.

The tackle and methods of making it for the whole of the *Cyprinidæ* is of a parcel, and therefore, to put the novice in possession of the entire subject I shall commence with

TACKLE FOR CARP.

FIG. 78. ROLL PLUMMET.

This consists, as intimated on page 72, of the finest gut compatible with the supposed size of the fish and the skill of the angler. The best size hook is either No. 7 of the Limerick or Round bent hooks, or a No. 9 of the Sproat make. It should be whipped on with the finest silk, as directed in "How to whip a hook." The float should be of the lightest, as figured on Fig. 17, Nos. 2 or 5, page 403, and either cocked with split shot, or the weight devised as shown in Fig. 17, No. 3; of course it is reduced in size, and may be used as there explained, and so fitted on to the line, according to the directions given. As for roach, it is desirable to plumb the depth always, and this is done with a lead plummet of either of the patterns given (Figs. 78 and 79). Fig. 78 is roll of a lead foil, and the hook is enclosed therein, as represented; Fig. 79 is of solid lead, with the exception of a three-sided cavity, in which

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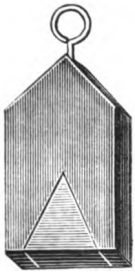

FIG. 97. SOLID LEAD PLUMMET.

is a piece of soft cork which receives the point of the hook (Fig. 79). As carp fishing is sometimes conducted where there is an undergrowth of bushes, &c., a very useful little tool is figured here (Fig. 80), which is placed on the top of the rod, its base being hollow; there is a loop to which a line is attached. The top of the rod lifts it up to the bough on which the hook may be entangled, and is then retracted, leaving the instrument suspended. The instrument may then be drawn away, and the bough or twig cut through.

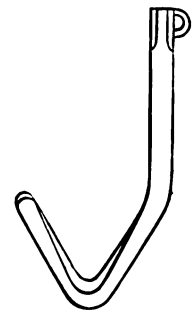

FIG. 80. CLEARING HOOK.

TACKLE FOR TENCH.

Carp and tench go together, because the tackle and baits that one will take the other will almost invariably adopt. The fashion of fishing with a ball of ground bait, out of which the hook projects, baited with gentle or other bait, which has obtained great success in the case of roach, will often answer equally well in the case of tench. I represent it as follows (Fig. 81). The hook may be a No. 8 Kendal.

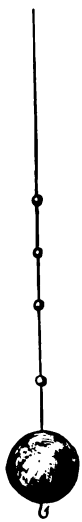

FIG. 81. BALL BAIT FOR TENCH, &C.

I also observed in the chapter on Tench that I had taken tench with an adaptation of the "bobbing" tackle in use for eels, and there described. Fig. 82 shows the actual "bobbing" apparatus for eels; the adaptation in question is simply a hook substituted for the needle. The method of baiting, &c., is described in the chapter on Eels.

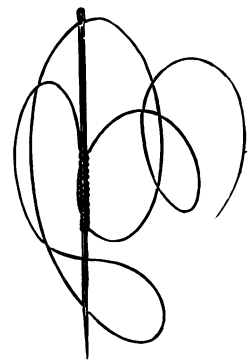

FIG. 82. BOBBING NEEDLE.

TACKLE FOR BARBEL.

The hook for this fish need not be longer than a No. 2 Round bend, or of my own style. The only special tackle beyond that described in the chapter upon the Barbel is the leger. Fig. 83, on following page, is the most approved form, and it may, if not

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covered in leather, as I suggested, be varnished with the green sealing wax varnish.

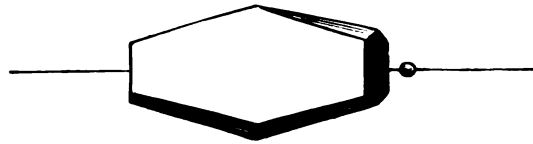

Fig. 83. Legger Lead.

Tackle for Bream.

The special tackles which require illustration for bream fishing, are the adaptation of the Stewart trout tackle, which is here represented (Fig. 84). There also is the style of hook which is equally applicable to barbel. It is whipped on the gut with two pieces of bristles, or one, according to fancy, or pieces of thin wire (Fig. 85). Fig. 86 shows the sort of barred float which I would recommend to all float fishers; it educates the sight by means of the bars of colour shown at D. These should always be sufficiently bright to be easily seen.

Fig. 84. Bream Tackle.

Tackle for Roach, Chub, Gudgeon, and Bleak.

This is as fully described as need be in the chapters devoted to a consideration of the capture of these fish. Anyone who has carefully read so far will readily understand that there is no material difference between the tackles for each. In every case the finest tackle is an indispensable necessary.

For chub an artificial fly is often used, but almost all those of the larger sort given for trout are useful. An artificial slug, either black or white, made out of the finger of a kid glove, which is best stuffed with pigs' wool or fine hair is good.

Fig. 86. Bar Float.

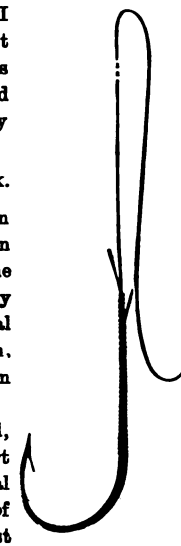

Fig. 85. Bream Hook.

Gudgeon and bleak really also require nothing especial, except, perhaps, a nicety in hooks. The patterns I have given are by no means exactly to my mind, being much too thick in the wire,

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and of a bend which is not satisfactory from any point of view. Some good fine-wired hooks have been sent me by Mr. Gregory, of Vyse-street, Birmingham, the manufacturer of which I do not know. They are capitally tempered, and great attention has been paid to the sharpening of them. Too great attention cannot be paid to the points, and it is astonishing how little the patterns have varied. The adoption of my style of hook will, I am convinced, sufficiently satisfy the angler.

Tackle for Perch.

This approximates to that necessary for the *Esocidæ* and the *Salmonidæ*. The style of fishing for perch is usually by live baiting with a minnow, but occasionally a spoon bait or a spinning minnow will take them. These have been shown in the foregoing pages. The paternoster, to which I have referred, may, however, be here shown the reader with advantage (Fig. 87). It will be seen to be composed of a length of gut or fine gimp, to which gut or gimp-tied hooks are attached at intervals. At the lower end is a plummet, and the whole is worked with a slow "sink and draw" motion. All other spinning and live tackles have been shown before. Ordinary stout float tackle, with No. 6 or 7 hooks on either this or the paternoster, are the most suitable. A small triangle, when the fish are biting freely, is often useful, but it is difficult to take from its hold, though extremely sure.

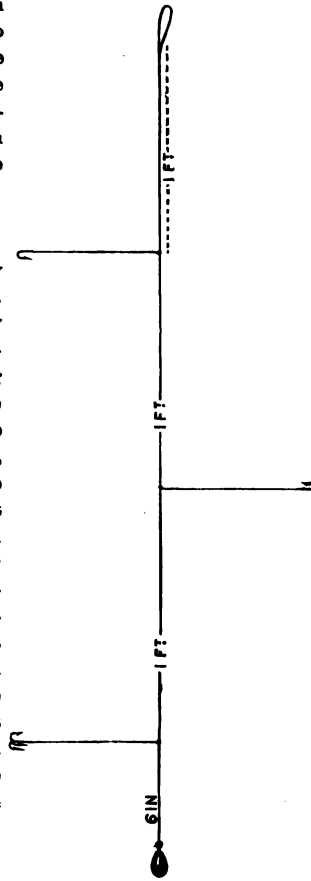

Fig. 87. Paternoster.

In the Broads of Norfolk a paternoster is sometimes used with a float, and there is thus a taut line between it and the lead. As there is no stream, the float is not pulled under the surface by the force of the moving water.

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CHAPTER XIV.

MISCELLANEOUS ITEMS OF OUTFIT.—CONCLUSION.

IN this concluding chapter it remains for me to refer to such of the paraphernalia of the angler's outfit as may not have hitherto received more than cursory mention. All along I have insisted that minute care should be exercised in the choice and preparation of all his appointments, and my remarks, requiring possibly at the hands of the initiated some modification or addition, will be received, therefore, in the spirit in which they are proffered, viz., as an endeavour to leave nothing worthy of notice in the volume unnoticed.

I will commence with the *landing net*, than which there is probably no more important appurtenance of the fisherman's outfit. The common fault of all landing nets is their limited size. They are rarely, unless specially ordered or selected, offered for sale of greater dimensions across the net iron than from a foot to eighteen inches. The result is that when a fish of greater length than the width of the net is desired to be landed an endeavour is made to get his head in it first. The hooks, very likely, in such case get entangled, and the fish, withdrawing his body by means of a powerful flap of the tail, backs out, leaving the would-be captor minus his quarry, and of some of his hook-barbs. Now, if the net had been wide enough to be brought up behind the fish, and receive it when its bent tail favoured such a reception, the danger would be done away with, and, no matter how the fish subsequently endeavoured to back out of his untoward pickle, there was the net to receive him. I therefore, as the outcome of this piece of experience, common at least to every jack fisher, advise a net iron, when pike or trout fishing, of at least 2ft. across.

If made of the ordinary iron net wire, the loop will not sustain the weight of a large fish, the wire being much too slight of gauge. The net iron, therefore, ought to be beaten taperingly, that is, thickest where

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the circumference meets its attachment, and, in order to allow of a new net being put on easily, without the necessity of the delay of whipping usually incurred, I always have my net hook made unclosed at that point opposite the insertion of the spike in the handle. In this wise, in fact (Fig. 88).

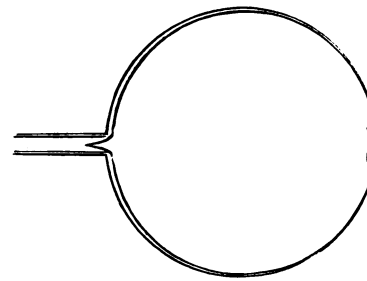

Fig. 88. Net Ring.

The net itself is best made of a plait dressed pike line, preferably dressed after made into a net. I prefer this material because it is not easily wetted through, and its knots and materials are hard, thus being more or less impenetrable by hooks. It is astonishing how seldom one has to waste half an hour in extricating one's triangle if such a net be used. For ordinary twine nets boiled oil is a good dressing. The net ought to be well dried after the application by hanging in a warm, dry situation. In every case let the angler observe never to put his net away wet, as it soon heats and rots.

A gaff is sometimes very useful in both pike and salmon fishing, though I prefer in each case the landing net. It simply is a well-tempered steel hook, with a sharp unbarbed point, which should always be protected when not in use by a cork or some other appliance. Its design ought to be regulated by the principles I have laid down before as to the manufacture of fish hooks—that is in relation to the desirability of the direction of force being the same as the angle of impact.

Tackle boxes are made of all sizes, shapes, and patterns. I would advise the reader to endeavour to get his made of sheet brass, and so ward off the annoyances of rust and the consequent deterioration of tackle. It is impossible to make a choice of such contrivances as either tackle boxes, creels, or fish bags, but I may say, in reference to the latter, that I have never found anything so capable of holding and carrying small or large quantities of fish like the somewhat ugly ordinary carpenter's tool basket.

Fig. 89. Disgorger.

I have omitted to describe a figure, the useful disgorger (Fig. 89). It is made of bone or wood ordinarily, and of the former I prefer it. It should be long—not less than ten inches, and then it is suitable for all fish. The cut annexed shows it. A good stout knife, with a corkscrew and tweezers combined, is

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also a useful accessory. Another very useful appliance for keeping the mouth of a fish—especially jack—open, is to be cut like the bifuricated trimmer described before. The two prongs may be forced into Master Jack's mouth, and the angler is then in no danger of his teeth whilst the disgorger is at work.

And now, in final conclusion, a word or two anent such clothing as vitally affects the angler in his peregrinations after sport—I mean boots, waterproofs, and their management. Boots should never be dried by the fire. Let them be placed in a warm room if you choose, and then fill them with oats—this is my plan. The grain absorbs all the moisture, and in the morning may be emptied out, and the boots cleaned and dressed. The best dressing in my opinion is deer suet. Where this cannot be got, cobblers' wax melted up with Russian tallow is the next best. Either of these applications preserve the leather, and allows of the subsequent application of blacking if the boots are desired to be polished—which, by the bye, fishing boots ought never to be. Indiarubber outer soles are useful when wading is to be done, because they afford a purchase that leather does not, and thus prevent slipping.

As to the waterproofs—be sure they are never folded wet, nor hung up except by a braid or string. At the best of times they are a nuisance, and I personally much prefer a good Scotch tweed overcoat; but if a hole has been punched in the collar or shoulder of your mackintosh, the wet soon by capillary attraction soaks throughout the inside. In the event of the fisherman desiring to mend a rent in his waterproof, he can do so with cement made by dissolving black indiarubber in turps or naphtha. It should not be too thin.

I have thus arrived at the end of my tether; every scrap of information given I have verified, either by means of unimpeachable authorities, or, as in the greater extent, by my own experience. If any reader not hitherto an angler be led to become a "Practical Fisherman," or these pages serve to perfect any lovers of the "gentle craft," the object of the little book will have been attained.

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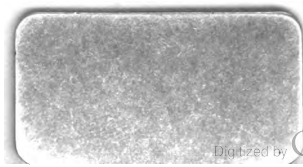
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